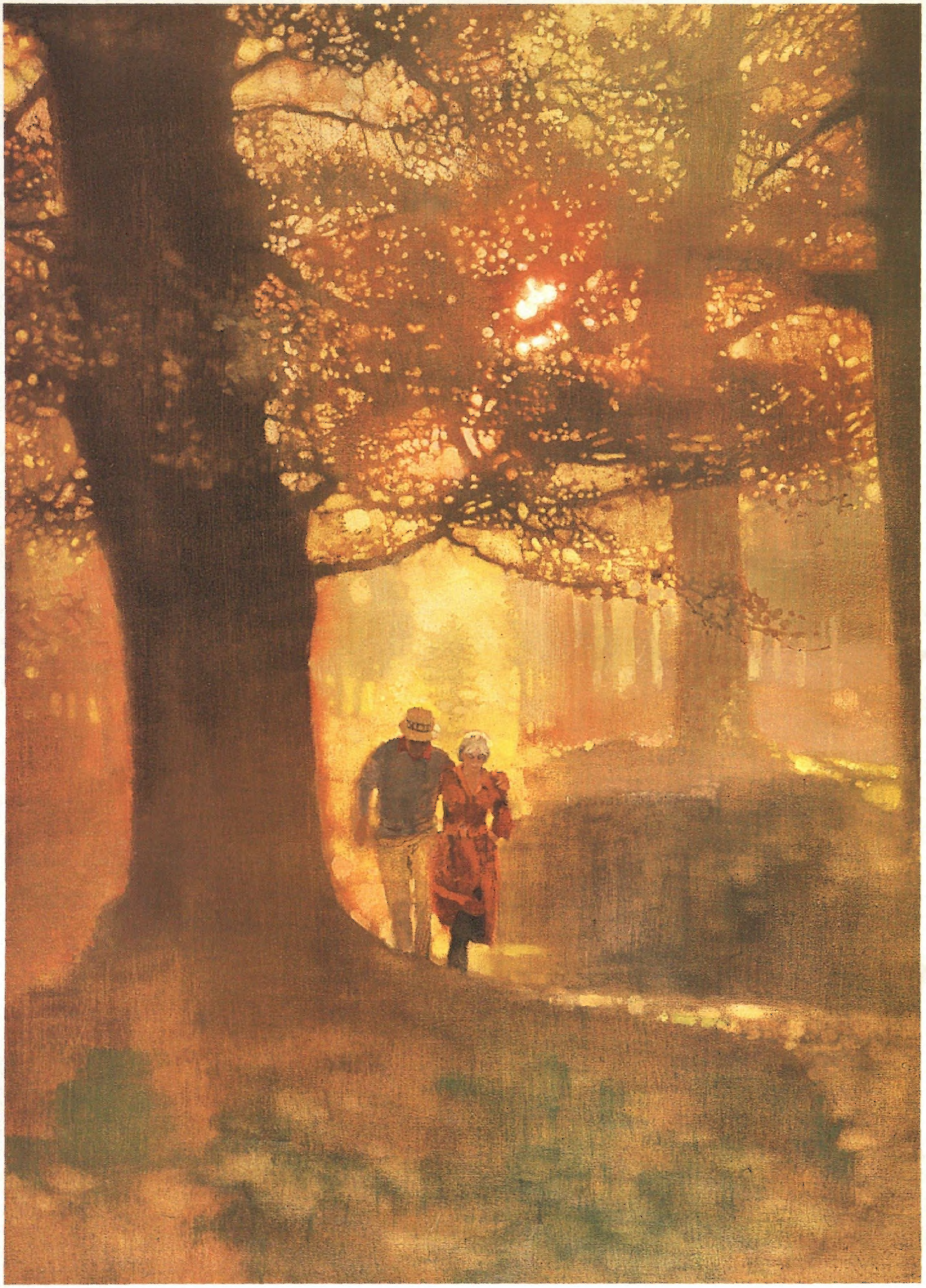
Smithsonian

October 1992

For Tissot's young woman croquet was a genteel game—my, how it's changed (p. 102)



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October 1992

Smithsonian

Volume 23, Number 7

Table of Contents

Cover: The player's elegance in this detail from James Tissot's *Croquet* (1878) contrasts sharply with the game's appeal to aggression (p. 102)
Art Gallery of Hamilton, Ontario

8 *Smithsonian horizons* by Secretary Adams
9 *Letters to the Editor*
15 *Around the Mall and beyond* by Edwards Park
20 *Phenomena, comment and notes* by John P. Wiley jr.
24 *October events at the Smithsonian*

36 **Taking the Wal-Mart cure in Viroqua, Wisconsin**
The town's economy is healthier and the place even looks better, but it took some strong medicine to do it
By Donald Dale Jackson
Photographs by Michael Melford

48 **The time is right to see Matisse**
New York's Museum of Modern Art offers the first full-scale survey of his works in more than 20 years

56 **Tragedy in the halls of Montezuma**
Sent just to explore and trade, in 1519 Hernán Cortés began the conquest and destruction of the Aztec empire
By Charles L. Mee jr., illustrations by Pierre Mion

72 **'If you can fish from your condo, you're too close'**
Orrin Pilkey fights the "rush to the shore" that's developing U.S. beaches and barrier islands to death
By Steve Kemper

92 **Natural history and the will to order**
A new book, *Finders, Keepers,* studies eight collectors and their attempts at helping nature get organized
Photographs by Rosamond W. Purcell

102 **Croquet: a civilized way to whack your pals**
The venerable game is far more than child's play, whether on weedy lawns or classy grass courts
By Richard Wolkomir, photographs by Patrick Ward

113 **A good frog is hard to find**
Not to mention a toad or a salamander. Amphibians are disappearing from many areas—why, nobody knows
By Beth Livermore, photographs by Dan Lamont

124 **From the heart, a gift of art**
Herb and Dorothy Vogel, who love the National Gallery of Art, pledge their 2,000-work collection
By Paul Gardner, photographs by John Dominis

135 **First Ladies on the campaign tightrope**
Martha Washington never had to electioneer, but most of the others have—with wifely vigor and tact
By Carl Sferrazza Anthony

160 *Additional reading*
162 *Picture credits*
163 *Book reviews*
174 *Smithsonian tours, seminars and expeditions*

176 **The big red hen and the Devil's Hoofprints**
By Bailey White

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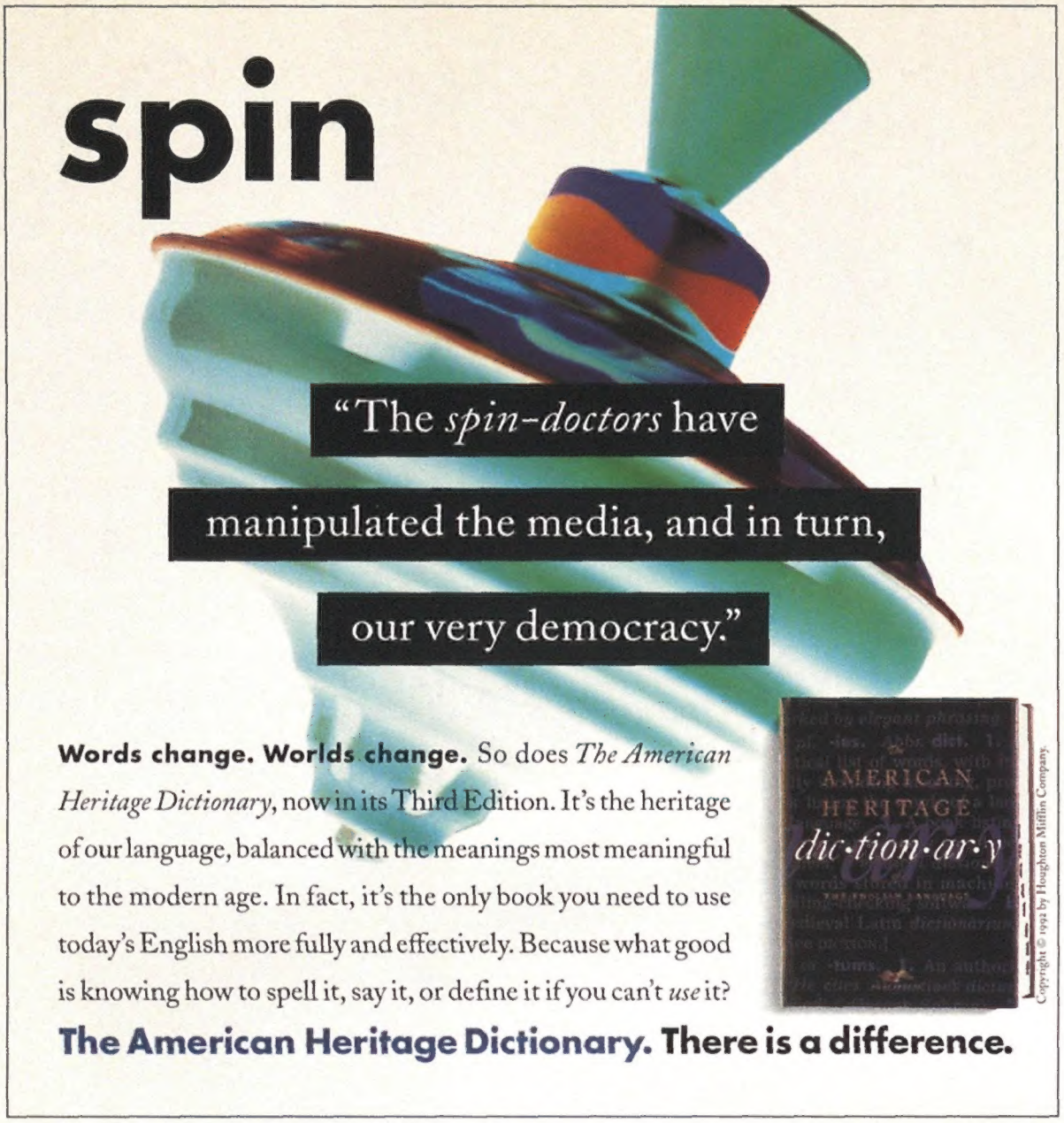
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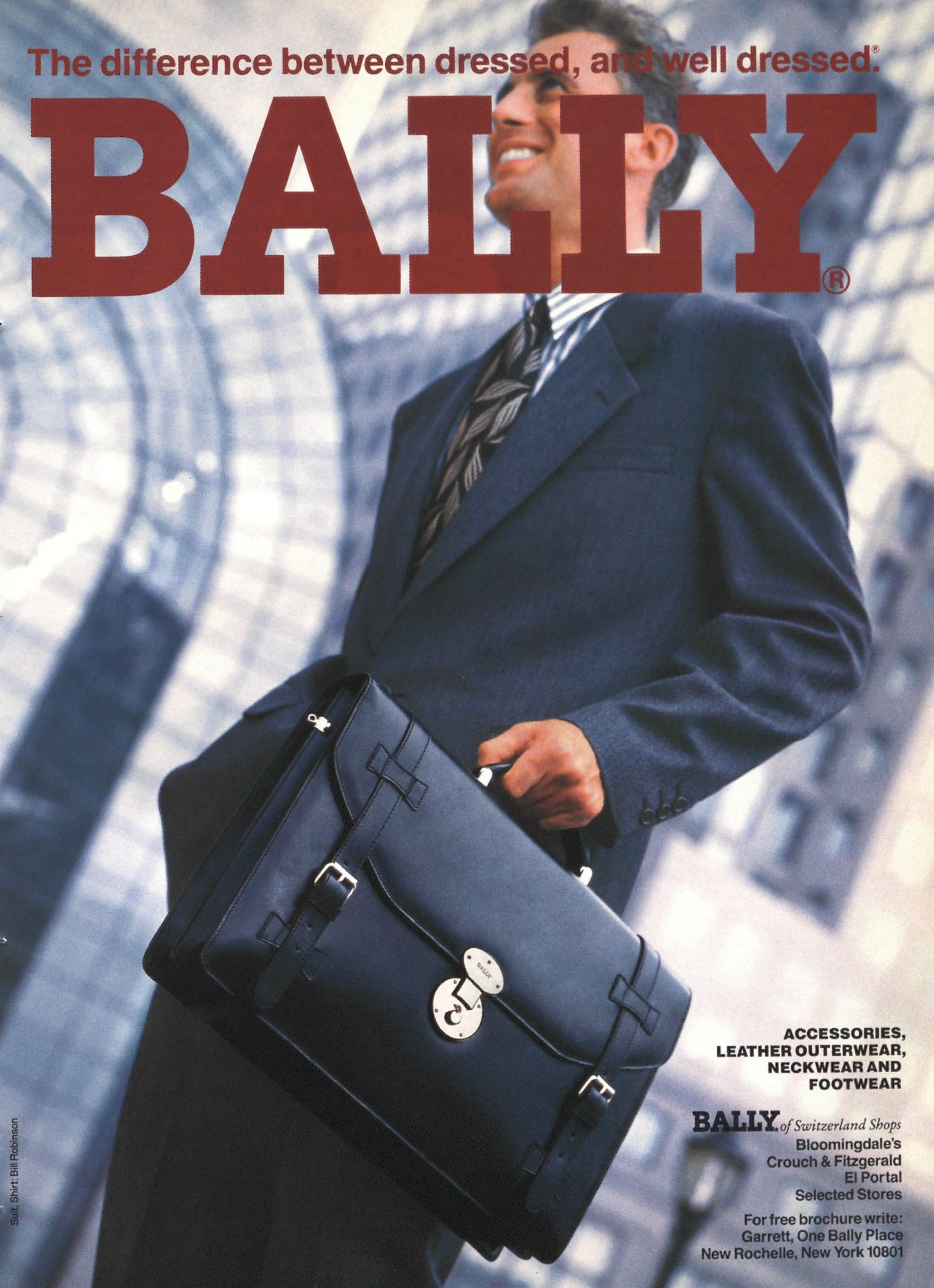

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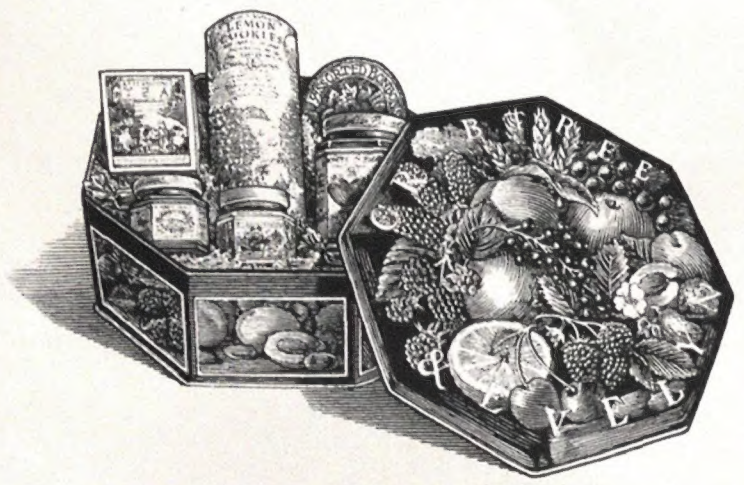

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Secretary Adams' comments

Smithsonian horizons

Now we take weather forecasts for granted, but the Smithsonian helped to make meteorology a real science

Large-scale climate and weather patterns are much on our minds today. We ingest the latest national checkerboard of hot spells and cold fronts with our breakfast television, while awaiting the local advice on whether to carry an umbrella. Global warming, long a scientific concern, has become a theme of diplomatic discourse among premiers and presidents. It has come to seem natural that a single interactive system embraces both broadly regional, relatively stable patterning and the uncertain, sometimes violent storm tracks that cross continents and oceans like scars.

How differently were these phenomena perceived before timely, reliable knowledge of anything other than current, local conditions was available? Our present surfeit of information did not smoothly replace conventional ignorance but required some fundamental alterations of basic beliefs. This is a story of the emergence of meteorology as a science during the 19th century, a development in which the Smithsonian, in its very first substantial undertaking, played a major part. During roughly its first quarter-century, a full 20 percent of the Institution's budget for publications, research and lectures was devoted to this ultimately rewarding process.

But not to anticipate the outcome, begin with the contrastive experiencing of the New World during discovery and colonization. Believing that North America's areas of settlement, lying at more southerly latitudes than much of Europe, should lead to more moderate conditions, early European settlers were unprepared for the harsh winters they encountered and for the frequent violence of storms. Storms—not weather as an integrated system—became a major focus of attention.

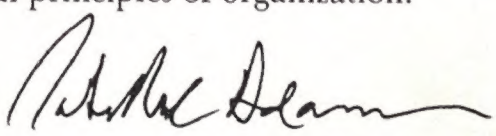
Benjamin Franklin ingeniously used the simultaneity of an eclipse and a weather front to confirm the northeastward movement of the front and assess its speed, while noting the puzzle that local winds were opposite in direction. For Thomas Jefferson, variations in weather conditions between the East and the more mountainous Western interior were a principal concern. Another issue inviting speculation was the possible impact of extensive clearing of forests for agriculture. Still another, especially for U.S. Army authorities, was the apparently strong correlation of climate with epidemic diseases. All this led to an earlier recognition in the United States than elsewhere of the need for systematic, simultaneous, standardized recording of local observations on a continental scale. But both the technical and institutional means to accomplish this lay far out of reach in the early Republic.

Lacking such data, heated theoretical controversies erupted in the 1830s over the basic causes and degree of unity of weather phenomena. There were persistent advocates of the primary role of opposed electrical charges, as well as of gravitational forces acting to produce wind currents and eddies as the Earth rotated. More highly regarded by the major scientists of the day were the physical insights of Navy meteorologist James Espy, who argued for the primacy of temperature-driven atmospheric convection currents. Characteristic of all views was an unbridled optimism well expressed by Elias Loomis, one of the Smithsonian's principal consultants:

"We are justified, then, in inferring that storms are subject to laws; that these laws are uniform in their operation, and that they may be discovered. . . . When we have fully learned the laws of storms, we shall be able to *predict* them."

Joseph Henry, the Smithsonian's first Secretary and a leading authority on magnetism and other geophysical phenomena, had a deep and abiding interest in this subject. Backing Espy and seeking to advance beyond the theoretical controversies, he recognized an extraordinary opportunity upon assuming office. With the aid of a network of up to 600 volunteers who at first submitted their observations monthly on standardized forms by mail, a factual basis could be established against which to test opposing theories. The advent of the telegraph in the 1840s enormously advanced this vision, permitting the first daily weather maps to be triumphantly mounted outside Henry's office in the Smithsonian Castle.

The Civil War disrupted this network for which, in any case, resources had proved insufficient to provide uniform and adequate instrumentation. By war's end, Henry had become convinced of the vast complexity of the phenomena that meteorology had set itself to explain, and recognized that unifying, general laws were not an early prospect. But the practical utility of timely, uniformly recorded weather information for commerce, agriculture and shipping—and the effectiveness of a corps of volunteers in joining with scientists and administrators to provide it—had been shown. That example allowed the Smithsonian gracefully to bow out by 1870, with the establishment of a Federal Signal Service. But it also permanently established a reliance on volunteers, which became one of the Institution's most fruitful principles of organization.



Letters to the Editor

Mount Rushmore

Dear Sir: My father, Walter Murphy of Salisbury, North Carolina, delivered the eulogy at the dedication of Gutzon Borglum's North Carolina Monument at Gettysburg on July 3, 1929.

Mr. Borglum, profiled in your August issue, sat a few feet above the frail Civil War veterans in the front row. Noticing those aged, crippled old men, he removed his hat.

Soon the midday sun was blistering his bald pate. Leaning over, I suggested he replace his headgear. With tear-filled eyes, he turned to me, whispering, "Child, I could never cover my head in the presence of those noble, heroic faces! Your father molds with words what I try to mold with my hands."
Elisabeth Murphy Henderson
Haworth, New Jersey

Dear Sir: One of my earlier assignments in 1936 as a newly hired field representative for the General Motors Acceptance Corporation [GMAC] was to collect, from sculptor Gutzon Borglum, a long past-due balance on his Cadillac automobile. He lived at San Antonio's historic Menger Hotel and devoted a part of his quarters there to his work.

I found him chipping away on a partially completed room-size statue. While continuing to add to the deep litter of stone fragments on the floor, he told me that the car in question had been up on blocks for several years. He said, further, that his executive-level friends at GMAC were familiar with and sympathetic to his financial problems.

In fact, he said, when he had run low on funds in Europe several years earlier, he had cabled GMAC and had been sent, as a loan, enough money to temporarily solve his problem.
Craig L. McNeese
Houston

Dear Sir: When I was growing up in Lead, South Dakota, in the mid-1920s, Mr. Borglum came to our high school and showed us drawings of his proposed work. All who had dimes contributed them toward the Mount Rushmore monument. Later, several of us were taken to Rushmore to witness what was billed as the first dynamite blast that began the work.

Borglum was rather small in stature, and he appeared on our stage wearing golf knickers. In our mining town one did not see men in golf knickers except on the golf links, and there were very few golfers in a town that owed its livelihood to the Homestake mine.
H. N. Houston
Harrison, Arkansas

Dear Sir: A footnote: Jefferson's likeness was originally to Washington's right. When partially finished [below], flaws in the rock were found to be so severe that Borglum blasted off Jefferson and began again, on Washington's left.
Arthur K. Baker
Huntington Beach, California

In 1931 Jefferson was at Washington's right (top); cracks caused move to left.

Dear Sir: Gutzon Borglum's seated figure of the Great Emancipator graces the walkway to the Essex County Courthouse in Newark, designed by Cass Gilbert, and not the Newark City Hall, as your caption states on page 66. Lincoln was recently refurbished and remains for me a gleaming and pleasurable landmark on my daily commute.
Jonathan E. Lazarus
West Orange, New Jersey

Little Saigon

Dear Sir: After two years of dating, my Vietnamese boyfriend moved to Garden Grove in the early 1980s, and I had an opportunity to spend several weeks in Little Saigon. When a table was overturned one night at the Ritz, everyone but me dove for cover. The patrons still had vivid memories of Vietnam and thought they were being shelled.
Gail M. Williams
Harlingen, Texas

Dear Sir: It is Hoa Tran, a former student of mine, demonstrating a Vietnamese style of Kung Fu in the photograph on page 36, and not Fong Yen Phi.
Louise Giacoppe
Huntington Beach, California

Dear Sir: The stone lion shown on page 31 is the male half of a traditional Chinese pair (the lioness is out of the picture, at left). They are symbolic defenders of law, protectors of sacred buildings, emblems of valor and energy.
William J. McGee
Newport Beach, California

The Golden Age of Andalusia

Dear Sir: Perhaps one reason the French under Napoleon didn't succeed in dynamiting the towers of the Alhambra in 1812 was that Alfred Nobel didn't get around to inventing dynamite until 1867, more than half a century later.
Bruce Sampsell
Chapel Hill, North Carolina

BayKeeper

Dear Sir: I am a lifelong resident of Jacksonville, located at the mouth of the St. John's River. This body of water faces a battle with pollution similar to that confronting San Francisco Bay.

The river has been in decline for decades. But now, with the increased awareness for the need to take an active stance in combating pollution, this decline could be reduced, even reversed. How-

ever, state and local agencies are faced with the same obstacles detailed in your story. I grew up fishing in the St. John's and now listen sadly as fishermen—commercial and sport—report fish are taken from the river with ulcers and open wounds.

We need a citizens' watch group similar to BayKeeper to maintain a vigil over the St. John's River.
William T. Mitchell jr.
Jacksonville, Florida

Crows fly far and wide

Dear Sir: When I was a 10-year-old youngster on an Iowa farm in the late 1930s the county paid a 10-cent bounty for a pair of crow's feet. Counseled by my uncle, I became adept at reducing the crow population.

I have watched them pulling up several feet of new corn, row by row. Intelligent, they can tell a gun barrel from a rake handle a quarter-mile away, and once hunted, become wary.

A single bounty would admit me to the town theater on Saturday night, or buy a hamburger and a Coke at the local café. When the 10-cents-a-crow turned into several dollars, it gave me an opportunity to become an economically contributing member of my family.
Rodney E. Phillips
Del Mar, California

Dear Sir: Some ten years ago, here at Mayfield Lake, I observed three crows harassing and actually attacking a bald eagle carrying a large fish in its talons. Eventually the eagle dropped the fish and fled; the crows enjoyed a fresh-fish dinner. This scene is repeated often here as crows gang up to rob both eagles and ospreys of their hard-earned catches.
Jess Maynard
Silver Creek, Washington

Dear Sir: The crow pictured on page 111 is on an apple, not an apricot, tree.
Jon F. Mehran
San Marcos, California

Dear Sir: In India some years ago, our home in Puri was in the territory of two crows and a raven. We used the crows as dishwashers, leaving our porridge pots and bowls under the water pump for them to clean. This lasted until the raven drove them off, wanting all the goodies for itself.
Gretchen Beck
San Francisco

Dear Sir: Crows are nest robbers. I observed crows carrying off three robin nestlings from a tree in my backyard. The parents tried to fight off the malevolent thieves, even pursuing and pecking at them, but to no avail. The mother bird returned to her upturned nest, and for the rest of the day I heard her anguished, discordant chirping—far different from her usual cheerful, bubbling caroling. I have no sympathy for crows.
Hazel Helmandollar
Bristol, Tennessee

Dear Sir: Crows are in great abundance here on the Olympic Peninsula. My son, a guard at Clallam Bay Prison, often takes a work party of inmates into the forest to cut timber. At lunchtime the inmates will toss the crows slices of bread. The birds know they can fly with one slice but not two—the wind resistance is too great. Not to be denied, a crow will take one slice in its beak, fold it and hold it down with a foot. It repeats the procedure, placing the second trophy atop the first. The crow then flies off with both slices firmly clutched in its beak.

This shows real ability to reason, and I resent the human tendency to use "birdbrain" to denote lack of intelligence.
Dorothy S. Ludwig
Joyce, Washington

Dear Sir: Each morning I am awakened by one of nature's ugliest sounds: the cacophonous cawing of crows. Six of them have made my backyard their daytime home. Their caterwauling forces me to use earplugs to read and headphones to listen to music. Short of committing a felony, I can't think of a way to get rid of them. With my luck, they will hang around, and winter on Staten Island will be long and loud.
Timothy Burns
Staten Island, New York

Dear Sir: My father, a self-educated naturalist, gleaned his knowledge of birds and nature from keen observation. During the Great Depression, our entertainment was spending many happy hours walking the fields and woodlands in rural Pennsylvania. "More like people than people," was father's frequent comment about crows.

On one cold afternoon in late fall, we saw a gathering of them in a large, solitary pasture oak. One bird was apart from the rest. Father excitedly pulled me down to a crouch, saying, "It's a crow court. They punish their own, just like we do!" We must have hunkered down in that stubbly field for an hour, watching and listening to the fervent dialogue being exchanged among the assembled birds. Finally, with much flapping and cawing, the session ended with the culprit being driven off by the entire gathering. "He's been banished," Father said; "they'll not let him fly with them again!"
Mary Ellen Schmidt
Troy, Michigan

Dear Sir: I have successfully raised and educated two foundling crows that turned up on my doorstep. (Don't worry, I would never take a crow directly out of nature; these two had no other chance of survival.) Wing-Nut was a nearly dead fledgling. We overcame his serious malnutrition, restored his strength and taught him to fly, but he resisted all attempts to return him to nature. He became an extremely clever, black, glossy monster, who ran things to suit himself from his own 12-by-24-foot indoor-outdoor cage.

Lord Randall was also clever, but skittish. He lived with us for about a decade. Eventually he became brave enough to use our IBM typewriter, with keys to tweak, a bell to ring, a rubber roll to peck, paper to rip up. The problem was the terrifying lurch of the carriage whenever he hit the return. But he loved it. I still have several pages of his literary output.

Wing-Nut had to make do with the laptop computer, a considerably tamer machine, but he got the same kick out of it. He'd pound away at the keyboard, then peer up at the screen to see what he'd written, scanning the lines of characters in a most comical way. Wearying at length of such intellectual labor, he'd then try to peck the cursor off the screen. Since that didn't work, he went for what he knew *would* work: the "off" button. I soon learned to make backup files when Wing-Nut was around.

When turned loose, his excitement fed on itself, and soon he was frantically tweaking down the curtains, dive-bombing the lampshades, wrecking the houseplants, chasing the cat, pulling the telephone off the hook—all the while babbling crow nonsense. He never forgot forbidden objects, finding them, flying off to hide them in insane places. The Christmas tree had to be installed inside its own cage.
Nicholas Reinhardt
Lexington, Massachusetts

BRAZIL?

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Around the Mall and beyond

In autumn 1944 a skinny young "Jug" pilot bid his Australian sweetheart goodbye from the skies over Melbourne

Perhaps because it took place at 8:30 in the morning it felt like a pretty serious affair. A bunch of aging gentlemen, much the same size and mostly in blue blazers, showed up at the National Air and Space Museum to sip coffee and look with nostalgia at a new exhibit. An airplane had been trundled into position at the west end of the ground floor, where special displays appear in slow rotation.

The plane is a Republic P-47, the famed Thunderbolt fighter, a giant in its day—more than a 40-foot wingspan, weighing seven and a quarter tons. Looking at it, you wonder how one human could handle it all alone, much less jam it around in the contortions of combat and fire its eight heavy machine guns effectively. But pilots did, and the P-47, the "Jug," as we called it, probably brought down more enemy aircraft in Europe during World War II than any other American plane.

The gents in blazers were former Jug pilots, all the right size to fit that cockpit comfortably. They were members of the P-47 Thunderbolt Pilots Association, Ltd., a nationwide organization, and they'd hammered away at NASM for years to get their darling on display. Now that it was in the catbird seat, they were celebrating this massive single-seater, listening to a few words from Don Lopez of the museum, and from one of their own, a smallish, courtly-looking fellow. He didn't look like an ace, but he turned out to be Robert Johnson, who shot down 28 enemy planes in those blazing years. I wondered how Johnson and the others had looked in that lofty cockpit, half a century ago. How had I looked?

I belong to the association, too, and might have introduced myself. But this time I wanted to stay apart. I'd forgotten my membership pin, and my blue blazer had a loose button and an ancient smear of cheese dip on the sleeve. And I had private memories to sort out.

Staring at the great plane, I tried to recall details about flying it. But the squadron markings—black-and-yellow checkerboard on the engine cowling—weren't mine, and the black and white invasion stripes on the wings were used in Europe during and after D-Day; I never saw them in New Guinea.

I came up with a few blurred visions: passing a hand along that smooth wing in the early morning and feeling heavy dew; clambering up those footholds to the cockpit; the vile smell of the oxygen mask; the agony of being trussed in great discomfort for a long mission; the delight of landing at last, of seeing the runway stretching before that big round nose; the slowing, the reaching of those wide-spaced wheels; the chirp and rattle as rubber met the steel matting of a makeshift jungle airstrip.

We used to undo the shoulder straps while still on the landing run so we could stand up in the cockpit and feel warm prop wash drying our stale sweat. And we'd rub our numbed buttocks to get the blood flowing again. People wonder why I now work at a stand-up desk. Long missions in the Jug is why.

The press cameras finally finished with shots of the plane and of its former pilots gathered beside it, and I had a chance to study it closely. It was a D Model, all silver except for those markings and its glittering bubble canopy. I realized it was precisely the same type of P-47 as the one that changed my life, 48 years ago . . .

I was a skinny, weary New Guinea veteran in March of '44 when I got orders from my Fighter Group to join five other pilots on a ferrying trip to Melbourne. Down there, we'd pick up new P-47s, D Models, and fly them back to our base. We went willingly.

Melbourne wasn't a leave town like Sydney, and we loved it. When it turned out that the newly assembled Jugs all suffered from oil leaks, we were overjoyed. We met people, made friends and learned our way around this old,

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gracious city. We discovered it had no section, like Sydney's King's Cross, where you picked up girls. In Melbourne, you just met them, the way you would at home. And it happened that I met a family in a suburb on Port Phillip Bay and was introduced to a dark-haired young nurse trainee by her father.

As the oil leaks persisted in the new planes, day after day, I found my life changing radically. Instead of the obsession with daily survival that I'd learned during 13 months of combat missions in New Guinea, I now could concentrate on getting to the staff entrance of Prince Henry's Hospital on time for our dates. Sometimes we'd go to a nightclub and dance to the Mills Brothers' "Paper Doll." Sometimes she'd be tired from night duty or studying for her finals, and we'd sit under a tree in the Botanical Gardens, and she'd fall asleep leaning against it in the lingering autumn warmth.

Time meant so much, back then, and ten days was quite a lot. Though we saw each other every day, she managed to get through her exams, and we celebrated at Luna Park, with its hair-raising roller coaster and hilarious "Dodge-'em" cars. I blew some of my flight pay. She said I shouldn't have.

Then early one morning, the test pilots phoned us squadron pilots at our billet in town and broke it gently to us that all six P-47s were ready, that their 2,000-horsepower Pratt & Whitney engines were clean and tight. They were fueled up for a flight to Sydney. From there we'd fly north. For me, the bad time had come, as I knew it finally would.

She was off duty until later that morning, and I hurried to her house on a rattly green tram with open sides. We had time to walk together to the beach, only half a block away. We talked a little and held each other. Then we both had to leave.

"I'll fly over the hospital," I said.

"Don't get too low," she said, "or you'll get into trouble."

"I'll blip my engine and waggle my wings," I said.

"That would be fine. I'll ask some patients to watch for you and tell me."

I met the other five pilots, and we were all quiet, driving to the test strip beside Melbourne's harbor. The planes were aligned; no squadron colors yet,

P-47 "Jug" was a World War II superstar despite its weight of seven tons plus.

just silver, gleaming in the sun. We planned our course for Sydney—"northeast to the coast; follow it north and turn left when you see the harbor"—and we agreed to stick together.

"I want to break away after takeoff for a few minutes," I told them. Two or three others wanted to do the same thing. We worked out a rendezvous and climbed into our cockpits.

I strapped in my body, covered my face with helmet, goggles and oxygen mask, turned on the radio and started the engine. It sounded fine and reacted right when I wound up the rpm's to

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check magnetos and propeller pitch control. But this was a new plane, and it would have bugs. I wondered when one would show up.

The answer: soon. I was second to take off. A freighter, moored at the end of the strip, stretched its antennas across my takeoff path. I fervently hoped I'd clear the wires. Locking the shoulder harness and tail wheel, I poured on the throttle, and we rumbled off the ground. As we clawed toward those antennas, I reached with my left hand for the lever that would retract the wheels.

It didn't work. The lever was locked in position by a small catch that you were supposed to open with your fingers. The catch wouldn't stay open. It kept snapping back to lock the lever.

The ship was coming closer, and since a seven-ton fighter, fully fueled, doesn't like to fly with its wheels down, I was barely off the ground. Holding on to the stick between my knees so I could keep control of the plane, I brought my right hand down to hold the lock open while I raised the lever with my left. Then, as the wheels came up, I just had time to grab the stick and hike over the antennas. We were on the way.

I swung the P-47 into steep turns, left and right, to get the feel of her, and then climbed steeply, until I was high enough not to disturb a hospital patient. The city spread below. Prince Henry's Hospital had a central tower section, looming high, with buff-colored bricks. I spotted it and orbited steeply around it, jazzing the throttle back and forth so the sound, down below, would pulsate noticeably, loud and soft.

Four or five turns seemed enough, and I broke away. But this new plane was sweet in the air, the joy of flying was great and I was young and sometimes a little reckless. I badly needed to bid a proper farewell to this strange, peaceful time, and somehow get ready for the all too real world that lay ahead, to the north.

I lowered the nose and headed for the beachside suburb where we'd said goodbye only a few hours before. As I got lower I recognized streets and crossings. And then I was lower still, going like the hammers of hell, dodging chimneys on the slate roofs as they flashed past. I tried to keep track. Her house must be just about *here* . . . but it went by much too fast, like the time.

Easing back on the stick, I laid the nose on a cloud, and at 5,000 feet banked around to find the rendezvous. All six of us showed up, right on schedule. We took up our course to Sydney and on toward the tropics, to where the islands lay, all professionals again, heading for our job.

She'd been a beautiful plane, that one. I gazed now at her sister, there in the museum, as people left to get back to their offices, and the guys in blazers walked away, a little mistily. I guess most of them went on to swap yarns about combat in the D Model. But as I drove home, I couldn't think of any really good stories, even though I too had flown her in combat. The hero stuff had been erased by the rush of my own personal memories.

"Our" own memories, I should have said. My wife asked how the reception had gone.

"Fine," I told her. "You'd have enjoyed it. You might have recognized the plane."

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Phenomena, comment and notes

Today chemists mix and match natural components in food to replace fat; tomorrow they may give us synthetics

We humans do not seem to be evolving very fast, in part because modern medicine can keep all but the most infirm alive until at least the age of reproduction. Survival of the fittest no longer applies. That's fine by me. Science fiction illustrators used to portray future humans as having enormous heads, puny bodies and stick limbs because brains had taken the place of brawn. Even though none of us alive today would have lived to see such people, the mental images violated all our ideals of human beauty. (My daughter has taken to calling me an "orange on toothpicks," but it just so happens that a Greek god lurks beneath those atrophied muscles and bulging fat cells.) If this was evolution, a lot of us would pass, thank you.

Human culture in industrialized countries, on the other hand, is evolving faster and faster, moving farther and farther from the world in which our species evolved. It is the triumph of civilization that we don't spend our days wandering through the wild looking for something to eat. The problem is that we have become so successful in turning our backs on how we used to live that the soft life is what now kills us before our time. We tend to be as weak as those puny bodies with stick limbs, but because we eat so much we have pillows of fat over the sticks. If it were possible to inherit acquired characteristics (suppose, for example, sedentary office workers produced children with little muscle and lots of fat), then we might be born as couch potatoes, rather than having to invest thousands of hours watching electrons hit phosphors on the addictive screen to achieve that state.

While our level of physical activity is changing radically (for the worse, as any cardiologist can tell you), so is the food we eat. Our ancestors ate meat when they could, but the wild game they killed had only one-seventh the fat of beef we buy in the supermarket, and some of that fat was actually beneficial, the same fatty acid found in the briefly popular fish oil capsules people were buying a few years ago, but which is barely detectable in feedlot beef.

More often the Paleolithic people lived on fruits, nuts, seeds, legumes, roots, tubers, stalks, bulbs, berries, melons, gums, leaves, fungi and flowers. Women did the collecting, and their finds provided up to 80 percent of the calories consumed by the mighty male hunters. Ten to 20 plant foods might be the staples, supplemented by another 60 or so used less often. Their diet came perilously close to the bowls of twigs modern-day veterans of coronary care units bitterly joke about as their minds serve up chicken-fried steak and cherry cheesecake.

Even if our ancestors could have read consumer-health magazines, they would not have had to worry about what was once called roughage and is now called fiber, or getting enough vitamin C (humans and other primates are among the few animals that are not capable of synthesizing ascorbic acid themselves).

In some ideal world, we rational beings would realize that bacon cheeseburgers and hot-fudge sundaes were the work of the devil, and we would turn back toward the diet that worked so well for those hundreds of thousands of years. But then why go on living? Surely we can figure out a way to have our cheesecake and live, too. The news is that we have.

So far there appear to be no signs of a substitute for exercise. No one sells a tape you can play under your pillow while you sleep that will build muscle mass. No meditation technique allows you to close your eyes and feel your biceps swell. Getting off the couch and just doing it does have attractions that motivate some of us some of the time. Vanity is not to be underestimated. But perhaps the most appealing aspect of exercise, other than the ascetic satisfaction that you are doing something unpleasant that is good for you (and could

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keep you out of the cardiac catheterization lab), is that a surprisingly short way into a program, no matter how modest, you begin to perk up, mentally and psychologically, even before you notice any difference in your physical self. You acquire energy by using energy.

Exercise is grunt work. You do it or you don't. Food is something else entirely. We eat every day. What we eat is partly a choice of our rational mind, and partly—perhaps even mostly—an emotional matter. From a nutritionist's point of view, meat loaf and gravy offers protein, vitamin B-12 for our nerves, minerals and micronutrients. It also provides a megadose of saturated fat, which can give us everything from blocked coronary arteries to cancer of the colon. The actual wielder of the fork is not thinking like an analytical chemist, however, but as a harassed human being for whom the dinner table is an oasis from the slings and arrows of the day's fortunes. The meat loaf tastes great, produces a wonderful warm feeling of satisfaction and becomes an almost physical connection to happy family dinners of childhood. The eater knows that all that fat is not a good idea, but there is no way he or she will pass it up for a sensible salad. Maybe tomorrow.

While there may be no substitute for exercise, some of the best chemists in the country are working on serving up our cheesecake without the grief. For decades now, they have been giving us the sweetness of sugar (or high-fructose corn syrup, as the case may be) without the calories. We now have sweeteners 2,000 times as sweet as sugar, molecules that the digestive system does not recognize and so go through the body without leaving so much as a single calorie behind. They have given us meat substitutes, textured vegetable protein made from soybeans that shows up in faux hamburgers and sausage. Now laboratory chemists are giving us the taste and mouth-feel of fat itself without most of the fat. It has already become a $100 million business and is expected to grow 25 percent a year. Three-quarters of consumers are already buying reduced-fat dairy products.

Some of the new "fats" are simply familiar substances reworked for a new role: starches, gums and other emulsifiers. Others are made from protein, and still others are wholly synthetic. *Chemical & Engineering News* recently surveyed the new field and found American ingenuity alive and well. Replacing fat with either protein or carbohydrate immediately cuts calories; a gram of fat contains nine calories, while a gram of either protein or carbohydrate has only four. Much of the work involves modifying food components already recognized as safe by the Food and Drug Administration (FDA), which makes a difference of years in getting approval to place the product on the market.

In the area of carbohydrates, different companies are experimenting with corn, potato and tapioca starches, oat flour and oat bran, various gums, pectin (used for decades to gel jams and jellies), carrageenan (extracted from seaweed) and cellulose, which the body does not metabolize at all. The work with proteins is not so far advanced. To date, only one fat replacer is on the market in the United States. Two versions are available, one using egg whites and milk proteins, the other, whey protein. The former is now approved for

Introducing a Travelers Cheque for couples who

frozen desserts, while the latter can be used in mayonnaise, salad dressings and cheese. An ice cream made with the former fat replacer has had only limited success on the market, although personally I find it creamier than some of the "real" ice creams.

Few of the fat substitutes can stand the heat of frying. So the search is on for truly synthetic fats, which not only could be used for frying but also would be ideal for reducing our fat intake because the body will not absorb them. The experience of one company illustrates just how long and hard the road can be. Discussions with the FDA have been going on since the early 1970s. The company has spent millions of dollars developing and testing the product; its 20,000-page petition to the FDA includes more than 100 studies on animals and 25 on real people. The product could be used in frying: when used to make potato chips, for example, it would eliminate all the fat and more than half the calories. But the FDA still has not approved it, and the patent expires in 1994. Other companies are working on additional synthetic fats, but commercial success is not likely to come overnight. The FDA is being cautious, *Chemical & Engineering News* explains, because unlike artificial sweeteners that are used in very small amounts, fat substitutes might become a significant component of people's diets. No one knows if they might have negative effects.

Tinkering with our food supply seems almost sacrilegious. Some romantic side of me thinks we should return to the truly natural diet of those Paleolithic ancestors, even while I reach for the fake ice cream. But human beings are just as natural as anything else in this world, and perhaps coming up with an improved food is as natural as coming up with an improved spear point. You have to admire the cleverness of those who would improve our food.

Take the recent patents issued to a Cincinnati company for something called "nutriceuticals," as reported in the *New York Times*. These are foods with a pharmacological extra. The idea is to inject cows and chickens with dead bacteria of the kinds that infect humans. The animals will produce antibodies to those bacteria, and the antibodies will be present in their milk or eggs. You can drink your milk and ward off tooth decay, for example, or salmonella poisoning. So far there are some mysterious side effects. The hyperimmune milk, as it is called, also apparently lowers cholesterol and blood pressure as well as providing relief from rheumatoid arthritis. These effects are real enough that they are being studied at five hospitals. For good measure, the hyperimmune milk, like aspirin, reduces inflammation but so far appears safer.

It is all a little unsettling. Somehow fooling—or fooling with—Mother Nature does not seem quite right, whether it is managing an ecosystem to our short-term benefit or fiddling with our food supply. We are stealing the ruby from the navel of the sacred statue in the forbidden temple. And yet it is not for nothing we are called sapiens. If we can figure out a way to beat the system, let's go for it. Which leaves only one question: What kind of microparticulated-egg-white-and-milk-protein ice cream to buy tonight?

John P. Wiley jr.

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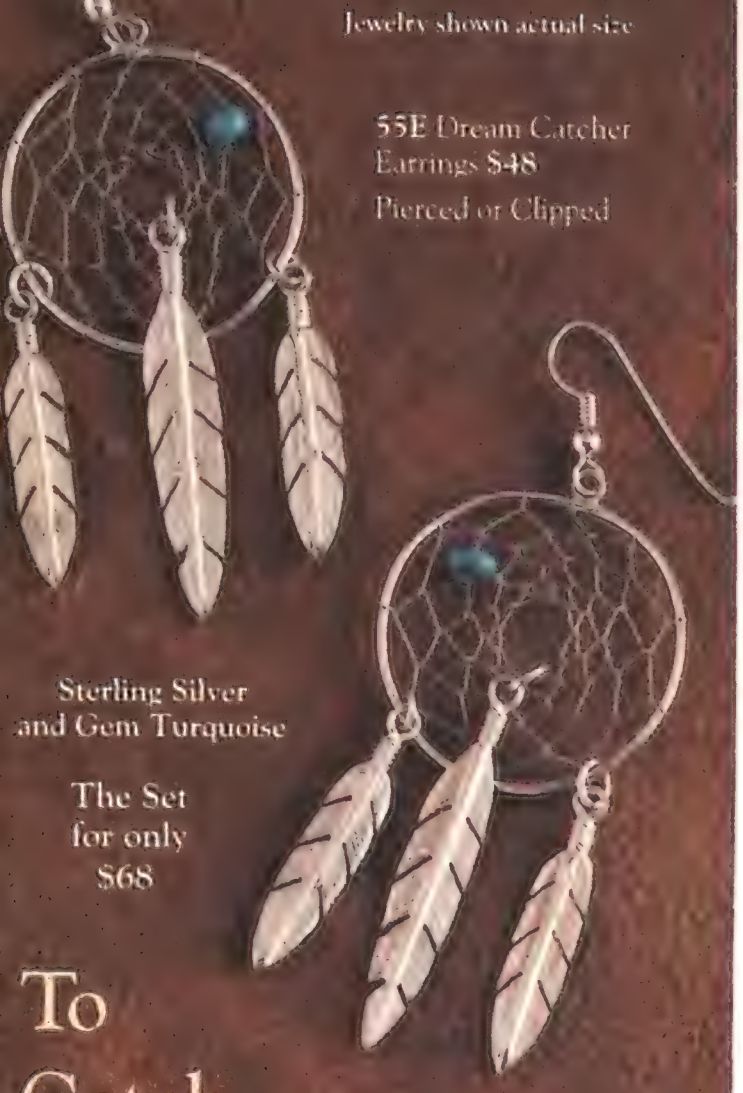

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Smithsonian highlights

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Begin your visit at the Smithsonian Information Center's Associates' Reception desk in the Castle, open from 9 A.M. to 5:30 P.M. daily. The Court, a restaurant for Associates located in the National Museum of Natural History, is open from 11 A.M. to 3 P.M., Monday through Friday, and from 9:30 A.M. to 3 P.M. on weekends.

Regular hours resume
Smithsonian museums are now operating on regular hours, 10 A.M. to 5:30 P.M. daily. Hours for the Anacostia Museum are 10 A.M. to 5 P.M. daily. Extended summer hours continue through October 15 at the National Zoological Park for grounds only, 8 A.M. to 8 P.M. daily.

Freer remains closed
The Freer Gallery of Art will reopen on May 9, 1993.

National Hispanic Heritage Month
The Smithsonian continues celebrating National Hispanic Heritage Month through October 15, with a variety of programs and activities. For information call (202) 357-2700, 9 A.M. to 4 P.M., Monday through Saturday. For 24-hour recording, call (202) 633-9126 (Spanish) or (202) 357-4574 (English).

Special October exhibits, events

Renwick Gallery
American Crafts: The Nation's Collection (through January 10, 1993) Exhibition honoring the Renwick's 20th anniversary showcases 130 objects that span the development of crafts in the 20th century. See *Highlights continued*, page 30.
Drawings by Craft Artists (through March 21, 1993) Drawing offers alternative avenue of expression for six established craft artists.

National Museum of American Art
Memory and Metaphor: The Art of Romare Bearden, 1940-1987 (October 2-January 3, 1993) A retrospective organized by the Studio Museum in Harlem that features the works of the distinguished American modernist—oil, watercolor, collage.
Folk Art Across America (runs indefinitely) An installation drawn from the museum's permanent collection recognizes the creativity of self-taught artists.

National Portrait Gallery
The Spirit of Party: Hamilton and Jefferson at Odds (through February 7, 1993) Show celebrating 250th anniversary of Jefferson's birth examines the conflict between the two statesmen.
Noble Heritage: Five Centuries of Portraits from the Hosokawa Family (through November 29) Portraits, from the 14th to the 19th century, of members of this prominent Japanese family.

National Air and Space Museum
Star Trek (through January 31, 1993) Show marks the 25th anniversary of the famed television series. Passes required daily; call (202) 786-2122 for details.
Air Power in World War II: Republic P-47 Thunderbolt (through May 31, 1993) Exhibit features the multirole fighter, nicknamed the "Jug," originally designed as a high-altitude pursuit craft. See *Around the Mall*, page 15.
Exploring New Worlds (runs indefinitely) New show at the Albert Einstein Planetarium examines the history and future of exploration.

National Museum of American History
Science in the Age of Columbus (October 12-March 26, 1993) Books from the collections of the Smithsonian Institution Libraries that reflect the contemporary knowledge of science before and after Columbus' voyages.

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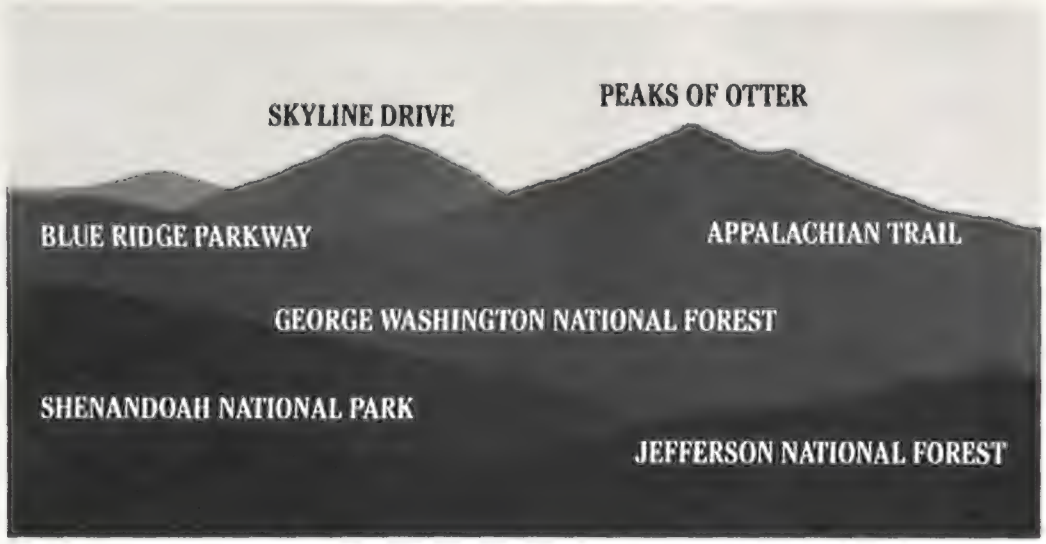

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Personal Legacy: The Healing of a Nation (October 27-June 7, 1993) Exhibition commemorating the tenth anniversary of the Vietnam Veterans Memorial looks at some of the objects and documents left at the Wall.
American Women in War (through February 1, 1993) Exhibit explores the involvement of American women in military activities.
American Encounters Permanent Quincentenary exhibition focuses on the American Indian, Hispanic and Anglo-American cultures of New Mexico's Upper Rio Grande Valley.
First Ladies: Political Role and Public Image Permanent exhibit explores the various roles of our nation's First Ladies. See page 135.

National Museum of Natural History
The American Wildlife Image and Charles Fracé (October 9-May 2, 1993) Paintings by the noted American artist capture animals in their natural habitats.
EarthSense (October 2-September 1993) Exhibition of photographs focuses on efforts around the globe to safeguard our fragile, ever-changing planet.
Seeds of Change (through May 23, 1993) Exhibit explores the dramatic changes brought about by the exchange, begun 500 years ago, of sugar, corn, the potato, the horse and disease between the Old World and the New.

Arthur M. Sackler Gallery
Ancient Japan (through November 1) Exhibition of 258 artifacts—dating from 200,000 B.C. through the seventh century A.D.—documents the evolution of early Japanese culture.
Arts of Mughal India (through December 6) Paintings and objects from the late 16th to the 18th century trace the history of India's Mughal Empire.
The Arts of China (runs indefinitely) More than 200 objects, including sculptures and paintings, span 6,000 years.

National Museum of African Art
Elmina: Art and Trade on the West African Coast (October 14-February 28, 1993) Exhibit examines the early encounter between Africa and Europe by focusing on art and trade in Elmina, a trading post established in 1480 by the Portuguese on Africa's Gold Coast, now Ghana.
Recent Acquisitions/New Dimensions (through January 3, 1993) Etchings, linocuts, watercolors and ceramics by nine modern artists from Nigeria, Côte d'Ivoire, South Africa and Kenya.

Today's most wanted list

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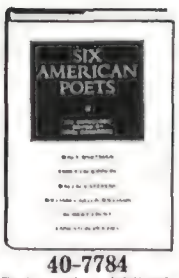

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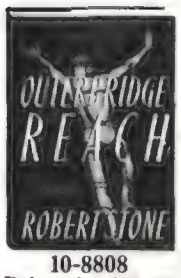

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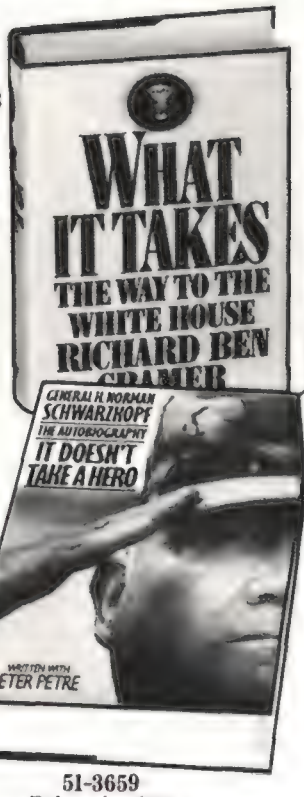

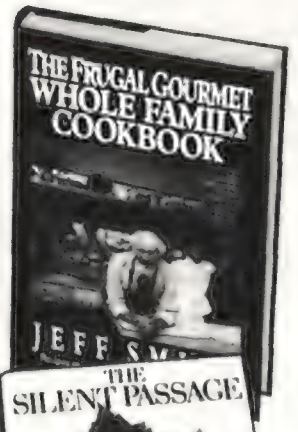

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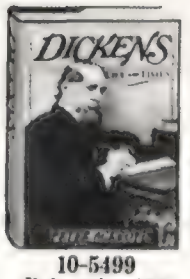

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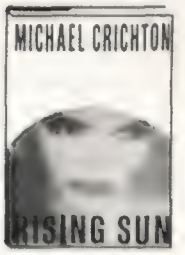

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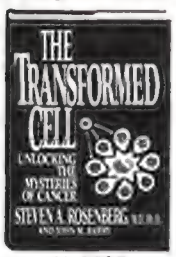

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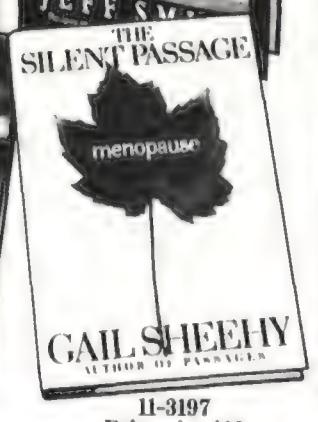

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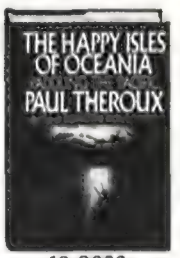

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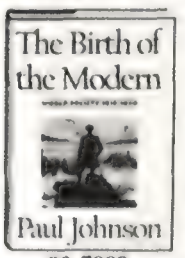

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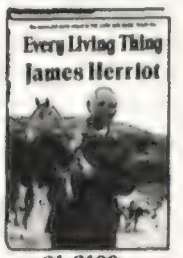

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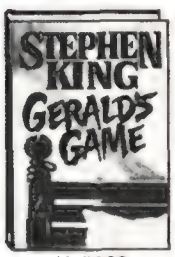

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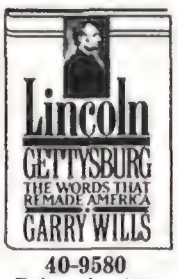

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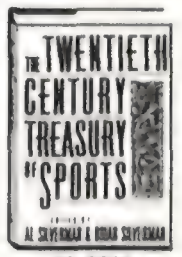

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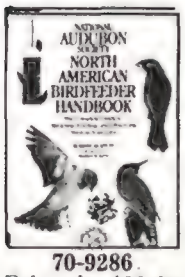

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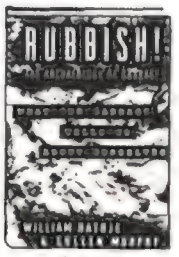

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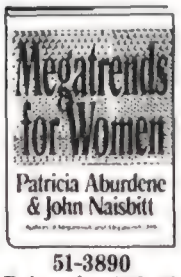

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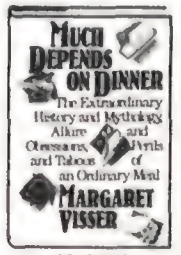

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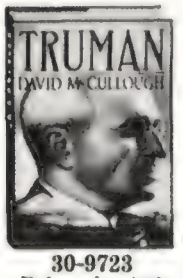

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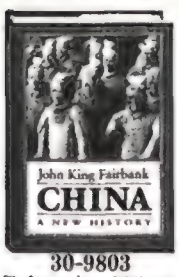

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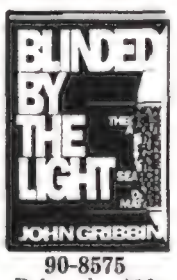

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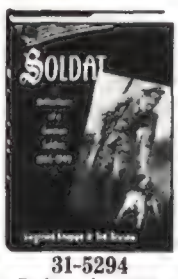

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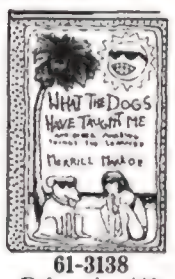

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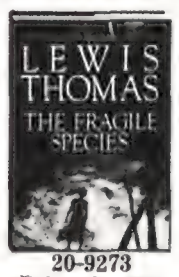

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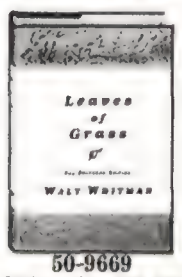

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H. **Sports**	1	2	3	4	5

Images of Power and Identity Recently reinstalled exhibit features 100 masterworks from the museum's collection.

Hirshhorn Museum & Sculpture Garden
Joseph Kosuth WORKS (October 1-January 25, 1993) Site-specific installation incorporates "found" texts from Kafka and other sources.
Eva Hesse: A Retrospective (October 15-January 10, 1992) More than 100 sculptures, wall reliefs, drawings and paintings by the German-born American artist.
Directions—Tim Rollins and K.O.S.: Animal Farm (through December 6) Artist Rollins and K.O.S. ("Kids of Survival," his students from the South Bronx) join with students from Washington, D.C. to create a painting inspired by George Orwell's 1945 book.

Anacostia Museum
To Achieve These Rights: The Struggle for Equality and Self-Determination in the District of Columbia, 1791-1978 (through November 1) Examines black people's struggle to secure equal rights.

Arts and Industries Building Experimental Gallery
The Kids Bridge (through March 1, 1993) Hands-on innovative exhibit from the Childrens Museum of Boston explores the complex social issues of identity, ethnicity, race and racism for children and their families.

International Gallery, S. Dillon Ripley Center
Imperial Austria: Treasures of Art, Arms and Armor from the State of Styria (October 4-January 24, 1993) More than 250 works chronicle the changes that swept Austria and Europe from the late Middle Ages through the 17th century.

Rotunda Gallery, S. Dillon Ripley Center
The Cutting Edge: 200 Years of Cut Crystal (October 4-January 24, 1993) Exhibition features a selection of crystalware from the 18th century to the present—decanters, bowls, goblets.

Cooper-Hewitt Museum (New York)
The Power of Maps (October 6-March 7, 1993) Exhibit of more than 400 historic and contemporary maps, dating from 1500 B.C. to the present, examines their significance as instruments of communication, persuasion and control.

Exhibition catalogs

Catalogs available currently include:
Memory and Metaphor: The Art of Romare Bearden 1940-1987 ($45 cloth)
The Spirit of Party: Hamilton and Jefferson at Odds ($12.95 paper)
American Encounters ($8.95 paper)
Eva Hesse ($60/$35 paper)
Imperial Austria: Treasures of Art, Arms and Armor from the State of Styria ($45 cloth)
Seeds of Change ($39.95/$24.95 paper)
To order, send check or money order to Smithsonian Museum Shops, 8308 Cinder Bed Road, Newington, Virginia 22122. Include 15 percent of purchase to cover postage, handling (minimum, $1.75).

Office of Elementary and Secondary Education

The Office of Elementary and Secondary Education (OESE) offers a variety of programs, publications and services for teachers of prekindergarten through grade 12 nationwide. OESE also provides information about educational materials and programs that are available to schools and teachers from the Smithsonian's museums. For more information, write: OESE, Smithsonian Institution, Arts & Industries Building, Room 1163, Washington, D.C. 20560.

Smithsonian on the air

The Buried Mirror: Reflections on Spain and the New World by Carlos Fuentes Landmark five-part television series marking the Columbus Quincentenary is scheduled for rebroadcast on the Discovery Channel: October 11 from 12 P.M. to 5 P.M., EST, and October 19-23 at 7 P.M., EST.
Indian Airobics A public radio special features native-American comedians, musicians, poets. Check local listings.
Sovereign to Sovereign A public radio special presents a panel discussion about the rights of Indian nations as they seek to become economically self-sufficient. Check local listings.
Spirits of the Present: The Legacy from Native America Acclaimed series of half-hour public radio programs celebrates the history and culture of native Americans. Check local listings.
Folk Masters 1992 Series of public radio broadcasts presents performances by virtuosos of New World folk music. Hosted by Smithsonian folklorist Nick Spitzer. Check local listings.

Smithsonian National Associates

The month of October will bring the National Associate Program U.S. and International Events to Fort Lauderdale, Florida, and Hilton Head Island, South Carolina. Events in Fort Lauderdale (October 1-4) will include lectures on the art of 1492 and a concert in celebration of the Quincentenary. The program in Hilton Head (October 22-25) will feature lectures on Impressionism and forensic anthropology.

Associates in Fort Lauderdale and Hilton Head will receive invitational brochures. For further information, write or call: U.S. and International Events, 490 L'Enfant Plaza, S.W., Suite 4210, Washington, D.C. 20560; (202) 287-3210.

Resident Associate Program

To become a Resident Associate, or for fee and ticket information, call (202) 357-3030. October events include:
Choosing the President (October 14; 7:15 P.M.) Distinguished panel discusses issues critical to the electoral process.
The Way I Was: An Evening with Marvin Hamlisch (October 26; 8 P.M.) The gifted composer of *A Chorus Line* reviews his life and career, and plays selections of his award-winning music.
Doris Lessing's African Laughter (October 15; 8 P.M.) The versatile author evokes a rich and personal portrait of her homeland, Zimbabwe.
When Brooklyn Was the World: An Evening with Larry King (October 14; 6 P.M.) The radio and television host captures the spirit, scents and sounds of Brooklyn in the 1940s and '50s.

Smithsonian Institution Traveling Exhibition Service

SITES organizes and circulates exhibitions to cities throughout the United States and abroad. To sponsor a show in your community, write SITES, Smithsonian, Washington, D.C. 20560. Here are some October exhibits:
• Honolulu, Hawaii (October 24-November 22) *Seeds of Change* (panel exhibition based on the NMNH show), Hawaii State Library.
• New Orleans, Louisiana (October 24-November 22) *Seeds of Change*, New Orleans Public Library.
• Omaha, Nebraska (October 3-November 3) *Perpetual Campaign: The Making of the People's President*, Western Heritage Museum.

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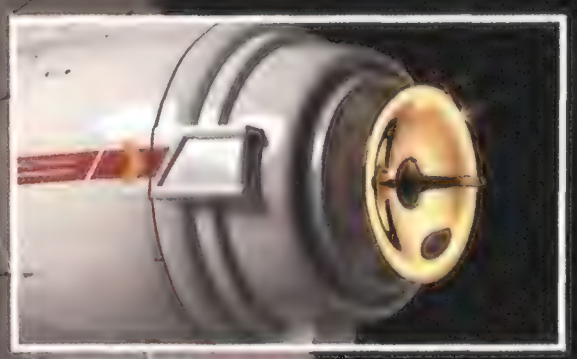

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A treasury of American crafts

The Renwick Gallery marks its 20th anniversary by showcasing its acclaimed permanent collection

An elegant, iridescent Tiffany glass centerpiece in all its simplicity meets the roughly textured intricacy of ceramist Peter Voulkos' free-form *Rocking Pot*: these works and others are showcased in an ambitious anniversary exhibition at the National Museum of American Art's Renwick Gallery. "American Crafts: The Nation's Collection" embodies the richness and depth of the gallery's permanent collection and represents both functional and purely sculptural craft traditions. On view from September 25 through January 10, 1993, the show's 130 objects track the development of crafts in the 20th century.

"Since 1972, the Renwick has focused national recognition on the creativity of the country's craft artists and traditions," says Michael Monroe, the gallery's curator-in-charge. "This show affirms and gives visibility to the remarkable achievements of these artists."

Works are selected for the permanent collection on the basis of "esthetic quality, historical significance, technique and style," explains Monroe. "The salient characteristic of the best work of art of any generation is that it joins tradition and at the same time overturns that tradition—creating something new. These pieces are outstanding examples by significant artists who have changed the course of the contemporary craft movement through their work."

Among the many nationally recognized artists included are Betty Woodman, Robert Arneson, Ed Rossbach, Dale Chihuly and Wendell Castle.

"Today, as crafts are increasingly recognized as an integral part of American art," says Museum of American Art director Elizabeth Broun, "we are immensely proud that the Renwick is known as the site of the nation's premier collection of American craft."

Diane M. Bolz

In 1978, Mary Lee Hu wove silver, gold and copper into an intricate neckpiece.

Flowing lines of Albert Paley's *Portal Gates* belie its forged-steel construction.

Graceful Favrile Glass centerpiece was made by the Tiffany studios circa 1916.

Bruce Mitchell did *Star Chamber* (1987) by turning walnut burl on a lathe.

Robert Whitley's three-legged *Throne Chair* (1979) has a commanding presence.

Japanese Imari ware inspired patterned surface of Ralph Bacerra's 1989 teapot.

Continues on page 32

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Listening to the East Wind by Rudy Autio combines painting with ceramic techniques.

Ed Rossbach used complex weaving process to create pattern for 1966 linen hanging.

Peter Voulkos literally poked holes in tradition with creation (1956) of seminal, expressionistic stoneware *Rocking Pot.*

Handsome sculpture of blown, cut, polished forms was made in 1977 by Harvey Littleton, a pioneer glassblower.

American Indian, Art Deco and quilt motifs influenced the design of Earl Pardon's 1988 multifaceted necklace.

The energetic, painterly surface decoration of Betty Woodman's *Pillow Pitcher* enhances earthenware form.

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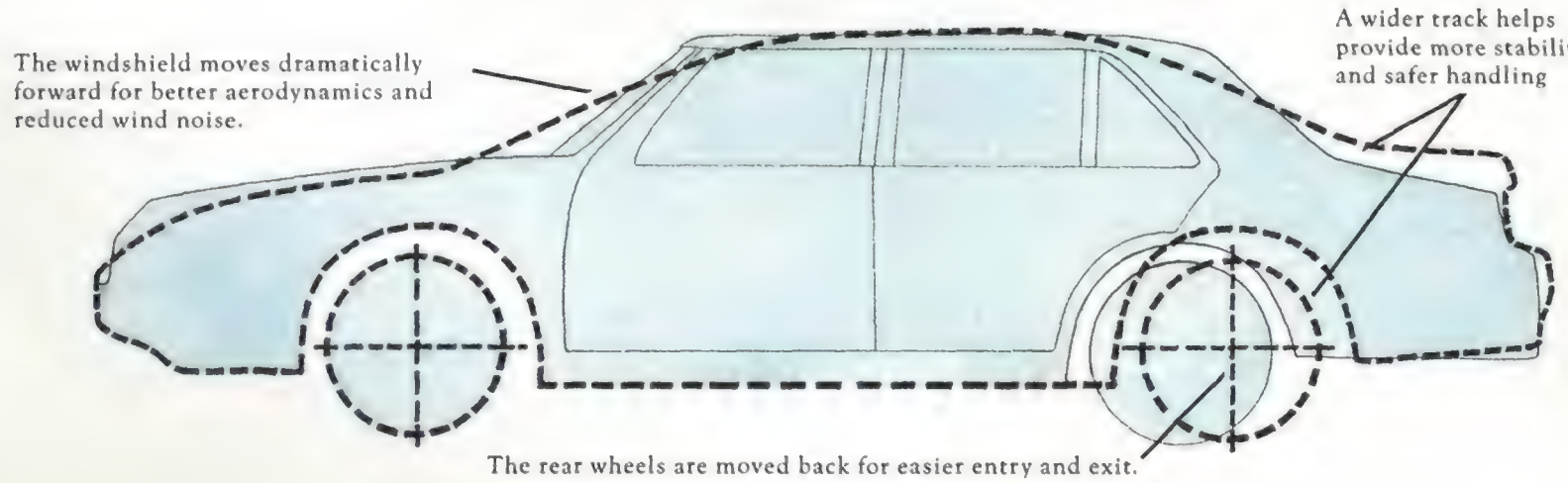
The windshield moves dramatically forward for better aerodynamics and reduced wind noise.
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The rear wheels are moved back for easier entry and exit.

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access. (As *Car and Driver* put it, getting into the back is "like falling into a barn.") The car has an extremely wide track. *Motor Trend* describes the results this way: "Lithe and agile...the balanced handling of a sports sedan...a ball to drive." If that sounds like no description you've ever heard of an American car, it's because these are like no American cars you've ever seen. Created not by a committee, but by a dedicated team of designers, engineers, manufacturers, parts suppliers and marketers, working together with one goal in mind: to produce a car that will compete with anything the world has to offer. You'll see how well we've succeeded on November 1st, when the Chrysler Concorde, Dodge Intrepid and Eagle Vision are introduced in a few weeks. Look at them, sit in them, price them and drive them. You'll understand why the automotive press has called them "a watershed event in auto industry history." In the car business, you lead, follow or get out of the way.

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By Donald Dale Jackson

It's wake-up time for Main Street when Wal-Mart comes to town

In many communities, smaller, older stores have already surrendered to the big discounter, but in Viroqua, Wisconsin, they're fighting back

Photographs by Michael Melford

Early in the morning Viroqua looks like any sleepy small town, but its buildings sport new awnings, fresh paint and spiffed-up signs. A more vital change is the aggressive new attitude of merchants themselves.

Rollie Felix can remember a time when tobacco buyers played poker all night at the Fortney Hotel on Main Street in his hometown of Viroqua, Wisconsin; when farmers delivered tobacco to the warehouse on sleds that backed up for blocks on snow-packed streets; and when the man at the cheese factory charged kids a nickel for a slab of cheese that made a fine lunch with a trout teased from Maple Dale Creek. As a boy in the 1920s, Rollie would sit in the locomotive as it revolved on the Viroqua turntable, and he often found himself wondering what went on at the Hoot Owl, a raucous local speakeasy.

Viroqua was a lively and self-contained county seat in those years, with a population of a few thousand people who frequently bore names like "Nelson" and "Anderson" and had relatives in Norway. Outside of town, the rich hill-and-coulee terrain that lists toward the Mississippi 20 miles west supported hundreds of tobacco and dairy farms. The smaller ones gradually consolidated into larger ones, but the farm families stayed on even after they sold out, often moving into town, and Rollie could identify the men by their coat size ("Hello, Nels. Forty-six long, I believe") as they passed through the door of the clothing store he ran as his father had before him, and his son does today.

It was always a neighborly community where secrets were hard to keep, and where folks across the street were apt to show up with rice soup or the crepe-like Norwegian dish called *lefse* when you were sick. But Viroqua, like hundreds of other small towns around the country, lost its confidence in the '70s and '80s. The railroad was gone, along with the creameries and cheese

Standard Wal-Mart sign attracts bargain hunters to a 40,000-square-foot building located on main highway two miles north of town. Wal-Mart stores are tough competition because they *do* sell many things for less.

factories, kids moved away as soon as they finished school, and more and more people did their shopping in La Crosse, 33 miles away. Nothing new ever seemed to happen in poky, irrelevant Viroqua.

The worst part was the loser mentality. By the mid-'80s, the four-block-long downtown business district had a dingy, let-it-slide look. Storefronts on the two-story brick buildings deteriorated, awnings sagged, and it felt like nobody cared. Everything seemed to dribble away. Merchants, the city council, the professionals and the farmers went their separate ways; the same seven or eight people turned up at every meeting. Viroquans voted no on whatever the question was and felt sorry for themselves.

Duffy Hoffland, a native who left as a young man and returned in 1984 as president of the State Bank, heard the same three store owners chorusing the same litany of complaints every day. People moaned that their unemployment and welfare rates were the state's highest, and their per capita income the lowest. It wasn't true, but they believed it. Viroqua wasn't going to die—it still had the courthouse, the hospital, several small industries and money in the treasury—but it talked like a quitter.

Then Wal-Mart appeared on the near horizon.

Fred Nelson reacted first, which wasn't surprising because Fred had the most to lose. When the sign was posted on Highway 14 north of town, in the spring of 1986, saying that a Wal-Mart discount store was coming soon, Fred felt a lurch in his stomach. His large general store, a block off Main Street, was squarely in the path of the country's most formidable mercantile juggernaut. Stores throughout the Midwest and South had folded by the score after Wal-Marts had come to their towns. Sam Walton's pockets were deep enough to permit him to make good on his boast that he wouldn't be undersold.

Fred Nelson, like Duffy Hoffland, had left Viroqua and then returned many years later. His Nelson Agri-Center, which he had expanded several times in the 32 years he had owned it, was the biggest retailer of farm supplies, hardware and clothing in Viroqua. Fred, with a mild, gentle manner that didn't altogether conceal a shrewd business mind, was one of the most admired men in town.

The Viroqua Wal-Mart was still just a crater in a

In the course of writing more than 30 articles for SMITHSONIAN, *the author has visited many small towns—none friendlier, he reports, than Viroqua.*

former cornfield when Fred took five of his department managers on a reconnaissance mission to a Wal-Mart in Anamosa, Iowa. He gave each person $20 and told them to shop in their specialties and learn whatever they could. They reported that, while prices were indeed lower, there were plenty of products Fred sold that Wal-Mart didn't. They said the clerks were pleasant enough but not particularly knowledgeable.

Other merchants didn't seem alarmed. "I'm not sure they knew what was about to hit them," Fred says. Store loyalty has a long tradition in towns like Viroqua, though it rarely survives a head-on clash with the likes of Wal-Mart. So Fred knew he had to act, and quickly. He eliminated health and beauty aids (no underselling Wal-Mart there), moved upscale on small appliances, upgraded his service department, liberalized the return policy and opened on Sundays. His biggest problem was popular "price-sensitive" products like power tools and motor oil. "I knew I couldn't sell a drill for $36 if Wal-Mart sold it for $29," he says. "I'd look silly; that's too big a difference. But I could hold on to my customers if my price was close, like $30 or $31." He took a smaller profit on price-sensitive items, while simultaneously broadening his product range in areas like farm tools and local crafts.

By the time the Viroqua Wal-Mart opened in the fall of 1986, with "We Sell for Less" emblazoned across the 40,000-square-foot building, Fred was entrenched in his carefully prepared merchandise niches like a soldier in a foxhole. Rollie Felix's son Steve, at the clothing store, and Trygve Overbo, at Overbo's Shoe Inn, worked out their own strategies. Steve conceded sweatshirts to Wal-Mart, eased his return policy and staged more-aggressive sales, while Tryg made house calls at local nursing homes and offered discounts on sneakers to high school athletes and cheerleaders. Mick Rockweiler, who sells large appliances, was nervous but hopeful that Wal-Mart might attract more shoppers to Main Street. If Viroqua wasn't economically viable, he told himself, Wal-Mart wouldn't have come. But other downtown businessmen fretted and stewed and one by one began to close—the J. C. Penney store, a dime store, a combination sporting goods-jewelry shop, a luncheonette, a hardware store. Viroqua seemed to be acting out a self-fulfilling prophecy of doom.

Nancy Rhodes-Seevers, who had moved to Viroqua from Southern California and launched a bed-and-breakfast (below) a few months before Wal-Mart opened, watched all this with a restless impatience. Nancy had roots in Viroqua, and it was roots and a sense of community she sought when she shucked the self-centered strivings of Corona del Mar in favor of a big Victorian house on Jefferson Street. She had little tolerance for the woe-is-me mind-set and suspected that there were agencies that could help turn Viroqua around.

She studied books listing state offices and began pestering bureaucrats with letters and calls. "I didn't know much about the agencies, but I knew enough not to be scared." Eventually she came up with the name "Bert Stitt" and the title "Downtown Coordinator for the State of Wisconsin." Though it was not immediately apparent, she had found Viroqua's Mr. Right.

Bert, a slight, always neatly dressed man with a zealot's shiny eyes and manner suggesting that loss of

Nancy Rhodes-Seevers shows peonies outside Queen Anne Victorian house that she runs as a bed-and-breakfast. She's known around Viroqua as "Mother Revitalization" because of the role that she has played in helping the formerly woebegone town to get itself turned around.

self-control may be imminent, is something akin to an evangelist whose mission is saving the souls of America's downtowns. Now a freelance consultant, he works mainly with small Midwestern towns in need of an infusion of energy or ideas to retain their identity and economic viability—towns like Viroqua. His aim is to instill a sense of community. He offers towns a six-month program of meetings, including a soul-searching retreat at which he helps participants hammer out their goals and a strategy to attain them.

Out of 10, they only rated "maybe a 2"

Nancy felt certain that Bert could help Viroqua out of its Wal-Mart malaise, but Bert was growing disenchanted with his state job and was reluctant to take on new assignments. Nancy badgered him until he agreed to visit. That was in June 1988. Rollie Felix, Fred Nelson and 32 others showed up to listen to Stitt's alternately insulting and challenging spiel.

Bert told them that on a scale of 1 to 10, their downtown was maybe a 2. He said that they would have to turn it around themselves, and that it would take money and time and a serious commitment. Fred and the rest listened politely, and dubiously, as Bert described the National Trust for Historic Preservation's "Main Street" program, which Wisconsin had recently joined. If Viroqua were chosen as a "Main Street" city, he told them, they would have to raise $150,000 with which they would hire a project manager to direct a three-year revitalization campaign. The state, in partnership with the National Trust, would provide experts, technical help and workshops to assist businesses in improving their looks and prospects.

The retreat was held four months later. Nancy rounded up 66 people for the all-day session at Nate's Supper Club. They broke into small groups and discussed what was wrong with Viroqua and the changes they wanted to see—things like building renovations, new streetlights, and strategies for luring new businesses and tourists. Fred Nelson had never seen the Viroqua establishment act in concert before; Steve Felix had never detected "that many positive vibes in one room." Bank president Duffy Hoffland didn't care for Bert Stitt ("he struck me as arrogant, he came on too strong") but concedes that "he got us motivated."

Mick Rockweiler kept his distance. "I figured I was making it on my own, and I couldn't see how this was going to help," he says. He worried that he might be asked to remove the large signs that stand out above his storefront (p. 37). Mick was also surprised, as many are, to learn that the Main Street program offered no direct grants. "They give you advice but no money," he says with eyebrows arched. "That shocked me."

Most of the Viroquans emerged from the retreat enthused about the Main Street program and bristling with newfound confidence. Stitt's goading style seemed to have connected. "American businessmen are such whiners," he says. "I convinced them that their problem wasn't Wal-Mart, it was them. They had to focus on what *they* were and weren't doing and how to change it." The transformation was apparent to everyone—"We were coming around to can-do from can't-do," Duffy Hoffland says. But there was still all that money to raise. Duffy had deep doubts about that and, as a bank president, his doubts were informed by experience. Biting the bullet, he volunteered to raise $150,000 in pledges. No fundraising campaign of that magnitude had ever been attempted in Viroqua.

Beginning with a list of 160 businesses, Duffy zeroed

Third-generation clothier Steve Felix (right) and his father Rollie remodeled store and upgraded inventory.

Banker Duffy Hoffland took on job of raising money from local businesses for the Main Street campaign.

in on a target sum for each according to its size. He played competitors off against one another, exploiting the potency of peer pressure. He asked board members of the newly named Viroqua Revitalization Association to call their friends. Eventually, incredibly, the pledges came. Even Mick Rockweiler ponied up, mindful that "as one of the largest retailers in town I should be an optimist. But I told them that if I had to move my signs, my contribution was to help pay for that." Mick was allowed to keep his signs. Duffy ultimately raised $140,000. The city council voted unanimously to kick in an additional $30,000. The banks and major businesses all donated, including almost every downtown merchant. "And the truly amazing thing," Duffy adds, "is that 99 percent of the contributors made good on their pledges." In three months, Viroqua cleared this highest hurdle on its road to revival.

Appliance merchant Mick Rockweiler goes along with revitalization but wants to keep his store signs.

Fred Nelson, a major force behind downtown renewal, has been in the farm supply business for 38 years.

Nancy Rhodes-Seevers, Steve Felix, Duffy Hoffland and city councilman Wayne Gates were selected to pitch Viroqua's case in the competition for "Main Street" designation before a panel in Madison (12 Wisconsin towns were vying for 5 spots). Each of the four Viroquans was given five minutes and assigned a subject—Duffy's was money, Steve's history, Nancy spoke on organization, and Wayne on the city government's role. Fred Nelson, now chairman of the revitalization board ("because I missed a meeting"), rehearsed them until they refined their act to a fat-free 19½ minutes.

It was Steve's idea to dress in turn-of-the-century outfits—the men in cutaways and striped pants, Nancy in an hourglass gown—to set themselves apart from other towns, while slyly displaying fidelity to the Main Street emphasis on historic preservation. Besides, the tuxes were provided gratis by Felix's formal-wear supplier. "Picture Woodrow Wilson's Inauguration," Steve says. "That's what we looked like."

Afterward, they felt so good about their performance—"We blew their socks off," says Duffy—that they stayed in costume for lunch at an Italian restaurant. "They asked if we'd come from a wedding," Steve recalls. Nancy said, "Yeah, I married all three of 'em."

Just pint-size but, "by golly, we won"

Still, Duffy and company worried that Viroqua might be too pint-size for Main Street status. Most Main Street towns are between 5,000 and 50,000 in population, and Viroqua (pop. 3,922) was among the smallest to apply nationwide. (There are some 700 cities in the program today.) One competitor was nearby La Crosse (pop. 48,000). When word came in August 1989 that Viroqua had been selected (La Crosse had not), the reaction was jubilation. "The feeling was we were the smallest but, by golly, we won," Fred Nelson remembers. "Maybe we were doing something right."

Theresa Washburn was just back from a Peace Corps tour in the Dominican Republic, and idling away a few days in Madison, when she saw a newspaper ad for a manager to run Viroqua's Main Street campaign. She was 27, with a degree in environmental design, an interest in historic restoration and an aversion to a linear career track, so she took a shot at it. But the Viroquans, sifting through several dozen applications, left her off their short list. Alicia Goehring, coordinator for the Wisconsin State Main Street program, suggested they talk to her. Theresa had applied to manage a larger Wisconsin town, as well, a community Alicia described as "professional, a suit-and-tie place." But she saw Theresa with her spunk and vitality as "more small-town and touchy-feely." The Viroquans promptly in-

Theresa Washburn, manager of town's Main Street program, holds binder summing up three years of work.

terviewed her and hired her for the $23,000 position.

Theresa's background made her a good fit. The idealism that had led her to the Peace Corps translated readily into a commitment to bring new life to downtown Viroqua. "I've always been drawn to small towns and rain forests—maybe I'm attracted to dying things," she jokes. But as the daughter of a U.S. Army doctor, she'd had a rambling and rootless childhood. She never felt that she came from anyplace. Viroqua became her surrogate hometown. Nor did it hurt that she had a Norwegian ancestor or two, as Viroquans were quick to discover. "My face is Irish," she explains, "but my hair [long and blonde] is Norwegian."

She started slowly—meeting people, organizing promotions for downtown businesses, passing the word about workshops on subjects like visual merchandising (making store displays more attractive), market analysis and business recruitment. Even more than most newcomers, she underwent a protracted probationary period. "Oh, they checked me out," she says. "There were several times when the rumors that came back to me brought me to tears. I was suspected of stealing the board's money. People told me that somebody just didn't like me, no reason. My boyfriend and I were harvesting tobacco on his farm once, when we met a neighbor. He looked me up and down and said, 'So you're Theresa, eh? In the flesh.' I had to keep talking and prove that I was, well, regular, just like them."

An inkling of the feisty new force in town

Theresa's top priority was improving Main Street's dowdy appearance. She met with Duffy Hoffland and Ron Moilien, president of the First National Bank, and asked their help in establishing a $100,000 low-interest loan pool for renovations. When the bankers proposed a rate of 1 percent below prime, they got their first inkling of the feisty new force in town. "What's such a big deal about 1 percent?" Theresa replied. The bankers huddled and offered an interest rate of three-quarters of prime, with a floor of 6 percent.

One downtown building owner promptly took out a loan and began redoing the fronts of three stores. Not long afterward, Fred Nelson was gazing out the window of Theresa's second-floor Main Street office when his glance fell on a decrepit building across the street. It had been vacant since Wal-Mart forced Coast to Coast Hardware to close. "Fred and I had been saying that we needed a big project to get us going," Theresa recollects. "I was sort of kidding around and I said, 'You could buy a building and restore it.' " "I could buy that one," Fred replied, pointing. He made an offer and soon began a major remodeling that eventually brought three new businesses downtown.

A domino effect ensued. Steve and Rollie Felix fixed

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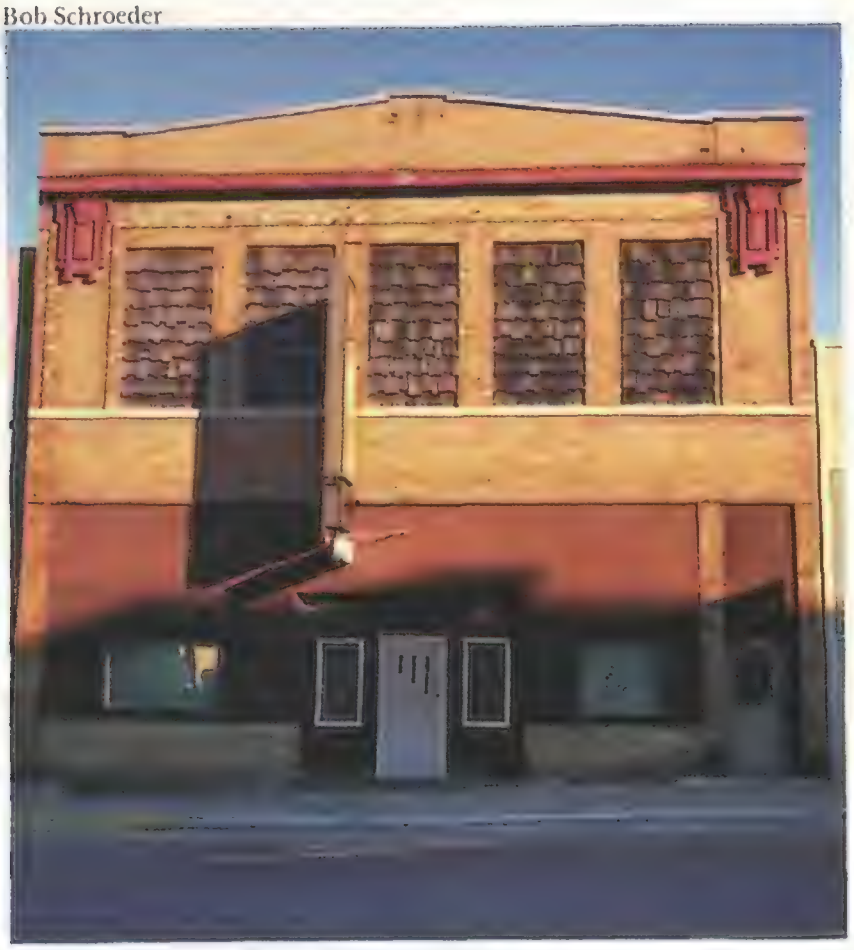

Before it was remodeled (left), Viking Inn had the dingy look of a typical Wisconsin tavern. Now (above) it has a banquet room with a dance floor and a bar upstairs, as well as a stylish canopy across the front.

up their store, though Rollie refused to jettison his old-fashioned flattop awning. Lavonne Swiggum, at the Viroqua Home Center, gave her store a face-lift and took over the former luncheonette next door. The Viking Inn spruced up its exterior, as did a Main Street insurance office. By the time the dust settled, 13 stores had renovated their facades, and Viroqua was beginning to look almost snappy, in a historically correct sort of way. The Main Street program asks that all renovations and additions be consistent with a town's historic character. There is nothing to enforce this guideline in Viroqua, however, except what Theresa calls the "wrath of Theresa."

The turning point for her came one day in 1990 when she looked out her window and saw four renovations in progress. "I suddenly realized it was all actually happening; it was working," she remembers. The revitalization board was talking about a dozen new projects, new members were signing on, the empty stores were filling up. Even the whiners who had aggravated Duffy Hoffland with their daily gripe sessions weren't convening anymore.

Theresa and the board kept the ball rolling with whatever promotional gambits they could dream up. One spring morning, for example, the town's businesspeople arose before dawn to cook a free breakfast for area farmers. On Saint Patrick's Day, Theresa hid clues all over town as part of a community treasure hunt. Downtown was still something less than beautiful, but it was clearly more comely than it had been

Workmen at intersection install new streetlight, a replica of 1930s cast-iron poles at the courthouse.

Ms. O'Brien's Students Learn At A Snail's Pace.

Second graders have a natural fascination with anything that creeps or crawls. So it was only natural for Pedie O'Brien to enlist a herd of snails to help teach scientific observation to her students at Bristol Elementary School in Bristol, Vermont.

"Children love tiny animals such as bugs, frogs and snails. I use that to help them develop an interest in science right from the start," says Ms. O'Brien.

Each student gets his or her own land snail, plus a clear plastic bottle and decayed forest material to build a "Snail Motel." Then the kids spend time getting to know their slow-moving charges. They discover how the snails respond to different tastes and smells. They set up a "Snail Olympics" to learn how the snails move over different surfaces such as string, clay, wood and paper. Then they write their findings in a Snail Fact Book that combines graphs, drawings, measurements and even poetry. By the time they're done, the second graders have a better understanding and respect for the little creatures.

"I believe it's important for children to learn to appreciate, respect and value the phenomena of nature," Pedie adds. "Besides, snails are fun!"

Teachers who make learning enjoyable should be commended. That's why State Farm takes such pleasure in awarding Ms. O'Brien our Good Neighbor Award, and in donating $5,000 to Bristol Elementary School in her name.

Pedie O'Brien. Teaching children to respect and enjoy the world around them makes her a very special Good Neighbor. Naturally.

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The Good Neighbor Award was developed in cooperation with the National Science Teachers Association (NSTA).

before, and even Mick Rockweiler was beginning to discern benefits. "I don't think it sold one refrigerator for me," he says, "but it brightened up the town. I think it's mainly image, you know, but that's OK too. But then there's Tryg Overbo. What did it get him?"

In January, Tryg closed the shoe store his family had run for 57 years. "Wal-Mart contributed," he says, "but there were other things too. When other stores closed, that cost us traffic. And the economy in general. I didn't turn a profit in nine years. Before Wal-Mart, I'd get 35 people a day in here. Afterward, it was 10 or 12." Tryg had been a Main Street supporter at the outset, but there's an edge of bitterness in his voice when he speaks of it now. "The town looks prettier, but it didn't help business, not mine anyway."

But even as Wal-Mart's registers sucked in cash, like a mercantile version of a white shark, the rest of Main Street Viroqua was hanging on economically and even inching forward. A new diet center and an antique store opened. Downtown merchants trooped to seminars where they listened to consultants tell them how to display and market and service. Theresa fielded occasional inquiries from merchants contemplating a move to Viroqua.

Statistics compiled by Alicia Goehring's office listed 7 new downtown businesses, 4 expansions or relocations (several moved in from the outskirts) and 22.5 additional jobs in the two years ending November 1991. And unlike many downtowns undergoing revivals, Viroqua was holding on to its retail character—clothing stores, pharmacies, groceries—rather than converting to boutiques and consignment shops.

Theresa and the revitalization board scored another victory when they successfully pressed the city to invest $350,000 in new downtown streetlights with a 1930s look. Before she seized on it, the streetlight project had been languishing for years. Theresa and a crew of volunteers also dazzled townsfolk at Christmastime last year by stringing lights along the tops of downtown buildings to brilliantly outline Main Street's modest skyline.

Wal-Mart, it now appeared, had been a wake-up call for Viroqua, a benefactor-motivator in wolf's clothing. Alicia Goehring ranks the town among the Main Street program's "shining stars—one of the handful that will go all the way." The sweetest validation has been the national attention—notably a CBS News report and a *Wall Street Journal* article—that led to calls and visits by citizens of other struggling cities.

The real payoff was neither celebrity nor profit but, rather, the confidence and cohesion Viroqua discovered within itself. "We realized we are a particular area, a neighborhood, and we can do something together," Lavonne Swiggum says. Bonnie Fortney, who under pressure from Wal-Mart transformed her fabric shop into a bridal store, says, "Everything's better since Main Street—my business, what I know, the attitude in town, the town itself." Councilman Wayne Gates ticks off several illustrations of the new civic spirit—a just-opened $500,000 community arena financed by contributions, a campaign for a fitness center that had netted nearly $1 million in donations by last February, an explosion in the local historical society's membership from 50 to 480. Even the Wal-Mart has joined the

National Guard band plays at opening last June of community arena built with $500,000 in contributions.

parade, contributing to Main Street projects and participating in special events. "We've gone from a 'mine-and-yours' town to an 'our' town," says Gates. "You can't force pride," Theresa adds, "it just happens."

But it's not just happening in Viroqua. Bert Stitt is hard at it, preaching the word all across the Midwest. On a nippy day earlier this year, he was in Preston, Iowa (pop. about 1,000), shaking his head as he toured its ramshackle two-block-long downtown, and then standing before a dozen citizens at a get-acquainted, how-I-can-help-you meeting. "You may not want to hear this," he began, "but I'd have to say that on a scale of 1 to 10, your downtown is maybe a 2 . . ."

Welcome sign proudly identifies Viroqua as a "Main Street" city and home of shuttle astronaut Mark Lee.

For *Zulma* (1950) Matisse painted, cut out and collaged paper, a process he called "drawing with scissors."

Matisse: a rare look

When Henri Matisse was 20, and starting out as a law clerk, he fell ill with appendicitis and stayed home to recuperate. His mother, hoping to distract her son, brought him a box of oil paints. Matisse soon gave up law.

From that day in 1890 until he died in 1954, Matisse produced a broad-ranging and revolutionary body of work. An exhibition now at New York's Museum of Modern Art has brought it together in the first full-scale survey of his paintings, sculpture, drawings and paper cutouts in more than 20 years. "Henri Matisse: A Retrospective," which continues through January 12, 1993, is unmatched in its scope, assembling almost 400 works, many never before seen in this country.

Consider the examples shown on these pages, all of which come from one source: the J. Rump Collection of the Statens Museum for Kunst in Copenhagen. Only *Le Luxe II* has previously been exhibited here—at the legendary Armory Show of 1913. From the early *Self-Portrait* to *Zulma*, they trace the artist's evolving use of color, from a representational tool to a design element in its own right, in his unending search for harmony of subject and surface design.

Danish engineer J. Rump began to buy French paintings in the spring of 1912, while visiting Paris. His goal was to make a collection of modern French art unrivaled outside France. When he gave it to the Statens Museum in 1928, Rump charged the staff with continuing his efforts. "All one has to do," he wrote, "is use one's eyes in the right manner and grasp the opportunity when the time is right." The opportunity to collect great works of Matisse may be past, but to see them, at MOMA, the time is right.

Alison McLean

The vigorous *Self-Portrait* (1906) shows early influence of Cézanne, whom Matisse dubbed a "god of painting."

Of paintings like *Nude with a White Scarf* (1909)
Matisse said, "I don't create a woman, I make a picture."

By 1906, in works like *Pink Onions*, Matisse began to mix sculptural forms and flattened, patterned surfaces.

The artist frequently incorporated his own sculptures into his still lifes, as seen in *Goldfish*, painted in 1912.

At the end of 1917 Matisse moved to Nice, where he lived for most of the rest of his life. *Interior with a Violin* was painted there in 1917-18.

The cryptic subject of *Le Luxe II* (1907-08) may be Venus being dried after emerging from the sea, while an attendant presents a bouquet of flowers.

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*Based on a February 1991 USA TODAY reader poll. **Supplemental Restraint System. Always wear your safety belt.

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WHAT A LUXURY CAR SHOULD BE

By Charles L. Mee jr.

That fateful moment when two civilizations came face to face

Cortés and his men were out for gold and glory; Montezuma's Aztec empire was shaky; the cruel result was a tragedy of history

Even before anyone came, there were amazing events: a comet appeared and split into three; the waters of the lake boiled up in a rage; a sign like a tongue of fire burned up into the sky, up to the heavens.

These and other remarkable things began to happen ten years before the Spaniards landed: omens that foretold their coming, said the old men who drew pictographs of them some 30 years afterward for the Franciscan missionary Fray Bernardino de Sahagún.

According to Sahagún's aged native informants, a messenger brought word of "towers or small mountains floating on the waves of the sea." The ships came in the spring of 1519, off the northern shore of the Yucatán peninsula. There were 11 all told (or, according to other sources, 10 or 12 ships), carrying 10 large bronze cannon, 4 falconets, or light cannon, stores of powder and shot, 16 horses, some large dogs, 550 soldiers (including 32 crossbowmen and 13 musketeers), 100 sailors along with 200 Cuban natives, several black people and a few Indian women.

The Spaniards, with their white skin, their suits of armor, their cannon and their horses, were an arresting sight. "They were very white," the old men told Sahagún. Their faces were like chalk. Indian amazement, in any case, has been the theme of most historians for the past four centuries and more, who have written of the Spanish ships of supernatural size and appearance. The newcomers were observed riding on the backs of extraordinary deerlike beasts, which snorted and bellowed, and whose running made tremors "as if stones were raining on the earth." Perhaps these creatures who rode such beasts were gods, white gods.

Yet the natives of the Yucatán and of Mexico could hardly have been quite as astonished as all that. In truth, just a year before, in 1518, the Indians had seen Spaniards cruise precisely this same coastline, in an expedition led by the adventurer Juan de Grijalva. The Indians had met the Spaniards and traded native gold ornaments and jewels for green glass beads, some scissors, pins and other trinkets. And the year before Grijalva, Francisco Hernandez de Córdoba had sailed into the Gulf of Mexico looking for gold and silver and slaves.

The new lot of Spaniards was led by Hernán Cortés, a soldier of fortune whose parents had destined him for the law until he had quit school at the age of 16. According to an account written years later by Cortés' private secretary and chaplain, Francisco López de Gómara, this "vexed his parents exceedingly. . . . He was a source of trouble to his parents as well as to

Aztecs welcomed Spaniards with gifts in April 1519, when Cortés' fleet anchored off San Juan de Ulúa.

Illustrations by Pierre Mion

In a battle at Tlaxcala, outnumbered Spaniards used European weapons against part of the Aztec empire. After defeat, Tlaxcalans, who resented the Aztec yoke, joined Cortés to fight Montezuma.

himself, for he was restless, haughty, mischievous, and given to quarreling, for which reason he decided to seek his fortune." Cortés arrived in the New World in 1504, and eventually was chosen by Diego Velázquez, governor of Cuba, to command an expedition to Mexico—for exploration and trade but, officially at least, *not* to conquer or colonize.

Even so, many of those who sailed with him were experienced soldiers of fortune, men who had signed up in the hope of getting fame and riches, as well as conquering lands for Spain. Tough as they were, they were also committed, in a way we can hardly understand today, to the mission of converting the Indians to Christianity. Along the route of their journey, searching for members of an earlier journey, they picked up Jerónimo de Aguilar, a Spaniard who had been shipwrecked eight years before, then enslaved by the Maya, learning their language. The Spaniards also picked up a woman sold to the Maya by allies of the Aztecs. They called her Doña Marina. She spoke Nahuatl, the language of the Aztecs, as well as Maya. As the Spaniards moved into Aztec territory, she was helpful, translating from Nahuatl into Maya, while Aguilar translated from Maya into Spanish.

On Holy Thursday, 1519, the fleet found safe harbor on the island of San Juan de Ulúa, as the Spaniards called it, off Mexico's eastern shore. As Bernal Díaz, one of Cortés' foot solders who chronicled these events years later, tells the story, they no sooner had dropped anchor than two large canoes came out filled with Aztec ambassadors. The Indians brought with them some gifts, and they were taken aboard the flagship and given food and wine and some blue beads.

"They said that their lord," relates Bernal Díaz, "a servant of the great Montezuma [as the Spanish spelled it], had sent them to find out what kind of men we were and what we were seeking." According to Gómara, the Indians also asked the Spaniards, with exemplary diplomatic tact, "whether they intended to stop or continue on beyond." Cortés replied that the Spaniards had come to speak to the lord of the Aztecs. (According to Sahagún's native informants the Spaniards were not as polite as all that. They put the Indians in irons and fired off a cannon to scare them.)

By Easter Sunday, a local Aztec governor had arrived. His name was Tentlil, and he was accompanied, says Gómara, by more than 4,000 men, all unarmed, handsomely dressed and loaded with presents. Tentlil had brought along some artists, who made portraits in the style of Aztec picture-writing, of Cortés, his captains and soldiers, his ships and horses and guns—a detailed report to send back to Montezuma. When Cortés asked to see Montezuma himself, saying that the Spaniards came as ambassadors from the greatest king on earth, Tentlil graciously replied that word would be sent to Montezuma. Some sources say that Tentlil at first inquired testily, "How is it that you have been here only two days, and demand to see the emperor?" Cortés

This article is adapted from The Years of Miracles, *to be published by Simon & Schuster. The author last wrote on the Black Death (*SMITHSONIAN, *February 1990).*

On long march through mountains to the Aztec capital of Tenochtitlán, the glittering Spanish army sometimes burned and massacred, but also recruited more armed allies willing to challenge Montezuma.

The route of the Spanish conquest of Mexico includes Cortés' retreat to Tlaxcala in the summer of 1520.

asked whether Montezuma had any gold, and Tentlil replied that he did. It was then, apparently, that Cortés said, in a phrase that has rung down through the ages, "Send me some of it, because I and my companions suffer from a disease of the heart which can be cured only with gold."

From his capital city of Tenochtitlán, the present site of Mexico City, the emperor Montezuma II ruled over a vast imperial domain in central Mexico stretching from the Gulf Coast to the Pacific Ocean, and as far south as present-day Guatemala. He was chosen by a group of about a hundred of the richest and most powerful members of the ruling class, and he had to maintain his rule with subtle and skillful maneuvering. Central Mexico at the time probably had a population of perhaps 25 million, with 2 million or so in the region about Tenochtitlán. Of these, perhaps a total of 500,000 could be mustered as soldiers, though the offensive force here comprised, on average, probably about 50,000 men.

Montezuma's reply to Cortés came back to the coast accompanied by more extremely lavish gifts, and word that Montezuma "rejoiced to learn about" Cortés' great king, and that Cortés should determine what he needed for himself and "the cure of his sickness," as well as whatever supplies he needed for his men and his ships. But, as for Montezuma and the Spanish leader meeting, that would be "impossible."

Undismayed, Cortés gathered a sample of Spanish wealth to send to the emperor, inquiring again about a meeting and the possibility of trade. While he waited he had some surprise visitors, five Indians from the city of Zempoala—a city, they said, that had recently been brought under Montezuma's yoke by force of arms.

This piece of news electrified Cortés. As Díaz puts it, he learned "that Montezuma had opponents and enemies, which greatly delighted him." Very quickly, Cortés would come to learn how extraordinarily fragile this great empire of Montezuma's was. Mexico was a loose organization of villages and city-states linked together in an uneasy alliance. Their inhabitants spoke more than 20 different languages and hundreds of different dialects. Their local loyalties made them resentful of central government. The empire, in short, was based upon the conquest and subjugation of many embittered peoples. Cortés instantly saw the possibility of revolt in Mexico, with himself as the leader.

Eager to be rid of Cortés, Montezuma apparently reiterated in his next communication that the Spaniards might have whatever they needed but then must take their fleet and leave. Now surer of his ground, Cortés refused. It was impossible, he insisted, for the Spaniards to leave without seeing the emperor. Montezuma had provided men to wait on the Spaniards, but about this time Cortés saw that these people had disappeared. He called his captains together and told them to prepare for war.

The route the Spaniards eventually took to Montezuma's capital city was circuitous. First they headed north, to Zempoala, finding the people ready to join in an uprising against Montezuma. From there, gathering allies, they moved on to Quiahuitzlan, where they came across some of Montezuma's tax collectors—and had them arrested. (Later Cortés quietly set them free for diplomatic purposes.) As soon as the chiefs of the neighboring towns heard that the Spaniards had arrested Montezuma's tax collectors, they joined forces with Cortés against Montezuma, and even took an oath of allegiance. Almost overnight his tiny force was increased by thousands of fighting men.

Stones came like hail from Indian slings

After establishing a base at Villa Rica de la Vera Cruz, the Spaniards and their new allies ventured into the territory of the Tlaxcalans, where their mettle was tested in battles with several thousand warriors. The Indians fought with clubs, spears, slings, arrows and darts; the Spaniards with lances, artillery, muskets, crossbows and swords. Some days of nearly continuous hand-to-hand fighting occurred. Stones came like hail from the Indians' slings, Díaz says, and "their barbed and fire-hardened darts fell like corn on the threshing-floor."

The Spaniards "wondered what would happen," Díaz adds, "when we had to fight Montezuma if we were reduced to such straits by the Tlaxcalans, whom our Cempoalan allies described as a peaceful people." But in the end they had the victory, the first of many.

How, in fact, was it possible for this little band of Spaniards to march into unknown territory, defeat the

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UNCOMMONLY SMOOTH

Historic meeting between the diplomatic emperor Montezuma and the relentless soldier of fortune Cortés took place on a causeway leading into the Aztec capital city. With Cortés is translator Doña Marina.

vast armies brought against them, and lose only two score or so Spanish lives in such encounters?

First of all, not too much faith should be placed in the numbers used to describe the size of the enemy. Though the various Spanish estimates range from 30,000 to 100,000 warriors, it is clear that if such numbers were accurate, only a miracle could explain a Spanish victory. That miracle would seem less necessary if, say, a decimal point were moved, giving the Tlaxcalans 10,000 warriors at most. Even so, the Spaniards were greatly outnumbered.

Not too much credit can be given to the Spanish crossbows. Although they outclassed Indian bows, they were difficult to use. Nor can too much credit be given to the purely material effects of gunpowder. Spanish powder was often wet, and the rate of fire of cannon and muskets was appallingly slow.

The psychological effect of gunpowder and horses and glistening armor, though, must have been phenomenal. The Spaniards must have impressed the Indians in the way that street demonstrators are impressed—and suddenly made to feel vulnerable—when heavily armed, modern riot police wade into the midst of a crowd. Besides, some Indian tactics helped the Spaniards. They tended not to kill their enemies, hoping to wound and capture them mainly for use as sacrifices to the gods. They also stopped fighting periodically to remove their dead and wounded from the battlefield. At close range, the Indians used wooden clubs tipped and ridged with razor-sharp obsidian—a vicious weapon against other Indians, but one which probably shattered against Spanish helmets.

The Spaniards brought their swords into this close combat, and they were dreadfully effective. Pointed and double-bladed, they could stab, and slash left and right, quickly killing or maiming. Driving directly at warriors clustered around their leaders, the Spaniards would often capture or kill a local chief. Once their chief was taken, his men usually fell back.

After two weeks the Tlaxcalans surrendered, agreeing to join Cortés against the Aztecs. As the Spaniards penetrated farther and farther into Mexico, they recruited allies until, when they reached Tenochtitlán at last, their force included about 5,000 Indians.

As the Spaniards advanced, they laid waste to the town of Cholula. It was there that Cortés killed 3,000 Indians, because, he said, they had plotted with Montezuma to attack him. Other sources describe it as an unprovoked massacre. In any case, as they approached Tenochtitlán the Spaniards' reputation for savagery and invincibility grew greater and greater.

By the time they had reached the city of Cuitlahuac, just southeast of Tenochtitlán, they had entered the lake country in the Valley of Mexico, where the towns were sometimes built entirely in the water, connected to the land by broad causeways. The towns and stone buildings, says Díaz, "seemed like an enchanted vision. . . . Indeed, some of our soldiers asked whether it was not all a dream."

As they approached the Aztec capital the Spaniards set foot on a causeway—wide enough for ten horsemen to ride abreast. And partway along it, Gómara says, they were met by 4,000 "gentlemen of the court" of Tenochtitlán, "richly dressed after their fashion," who,

each in turn, bowed to the Spaniards as a sign of peace. Then, just across a little bridge, the Spaniards saw Montezuma. "He walked," Gómara adds, "under a pallium of gold and green feathers, strung about with silver hangings, and carried by four gentlemen." He was supported on the arms of two royal princes.

Courtiers walked ahead of Montezuma, sweeping the ground and laying down thin mantles so that his feet would never touch the earth. Then came 200 lords, all barefoot, but wearing rich cloaks. Cortés stepped forward to embrace Montezuma; but the two princes put out their hands at once to prevent it. The two leaders exchanged brief greetings. Only then was Cortés permitted to step forward and take a splendid necklace of pearls and cut glass and put it around the neck of Montezuma.

The emperor ordered that Cortés and many of his Indian allies be shown to a beautiful palace. There, Montezuma himself took Cortés by the hand, bidding him, Cortés says, to "sit on a very rich throne . . . and then left saying that I should wait for him." In the heart of Montezuma's empire, the Spaniards and their allies were surrounded. The Aztecs, in turn, were surrounded by more of Cortés' allies outside the city. Frozen in this balance of forces, they commenced a curious diplomatic dance, one whose end was entirely unpredictable.

Montezuma, Díaz reports, was about 40 years old, "of good height, well proportioned, spare and slight." He bathed every afternoon, according to Díaz—twice a day, according to Gómara. The Spaniards, who sometimes slept in their armor without even removing their shoes, were impressed by the frequency of Montezuma's bathing.

For a time the Spaniards were left alone. The city in which they found themselves would have impressed anyone. Tenochtitlán lay at the center of a vast bowl dominated by high mountains. At the bottom was a large plain and many shallow lakes, including Lake Texcoco, a large body of salt water. The Aztec capital had been built up atop mudbanks and islands until, like Venice, it was a wonder of human artifice, laced with canals and bridges. Three long and wide causeways connected it to the mainland. An aqueduct brought fresh water from a hillside spring into the middle of the city.

Cortés describes a marketplace "twice as big as that of Salamanca, with arcades all around, where more than sixty thousand people come each day to buy and sell." The array of goods on sale reflected the far-flung trade that the Aztecs had developed: all manner of

Built up on an island in a shallow, saltwater lake, Tenochtitlán was a city of tall temples, busy canals, neatly ordered streets and bustling markets, more beautiful than any European city. And to Cortés and his men it dazzled "like an enchanted vision."

To avoid bloodshed Montezuma let the Spanish hold him as a prisoner in a palace in his own capital.

birds—chickens, partridge, quail, turtledoves, falcons—used for food, for feathers, for hunting; gold or featherwork in the form of butterflies, trees, flowers; a silver monkey that moved its feet and head; carved turquoise and emeralds; stuff made of conchs and periwinkles; toys for children; ointments, syrups and culinary delicacies, such as little barkless dogs that had been castrated and fattened. There were even cakes made from a sort of scum skimmed from the ooze on the lake's surface and dried, to be eaten like cheese. "Delicious," says Gómara.

All around the city, according to Cortés, were many temples, "beautiful buildings," but among them all, there was one "whose great size and magnificence no human tongue could describe." The main temple occupied a site about 70 by 80 yards at its base, with two staircases leading up nearly 200 feet to a terrace and twin shrines. There the stones were splattered black with the blood of human sacrifices.

Most often, the victim would be led or dragged to the top of the temple steps and stretched out over a block of stone by five priests. A priest would cut him open, reach in and pluck out his still-beating heart. The heart was offered up in a sacred vessel, often to placate the Sun. The body was thrown down the temple steps and then flayed and cut up. Its skull went to a great skull rack (where, according to Gómara, there were 136,000 skulls, arranged in rows, teeth outward), and the remainder was sometimes ceremoniously eaten, usually by the warriors who had captured the victim.

In the days to come, as Cortés and Montezuma met, Cortés broached his wish to convert Montezuma to Christianity and spoke of the evils of the Aztec gods—a topic of conversation that must have struck Montezuma as outrageously rude, and irrelevant to the business of conducting trade or to negotiations between an emperor and a visiting captain general.

A commander "beset with misgivings"

For their part, the Spaniards evidently became increasingly uneasy about the absurdity and perilousness of their position. Even Cortés himself came to feel "beset with misgivings," sharing a dreadful sense of being caught in a web from which he and his men could never escape. It had begun to dawn on them that there was no reason for Montezuma to let them leave Tenochtitlán alive. Eventually, they devised a most astounding way out of their dilemma. They decided to seize Montezuma and hold him hostage in his own city.

And so, says Gómara, Cortés took some of his soldiers with him to pay a call on the emperor. Cortés greeted Montezuma "as usual, and then began to jest and banter with him, as he had done before." But soon enough Cortés got to the point, and told the emperor

An unprovoked massacre occurred during Cortés' absence, when a Spanish garrison fell upon Aztecs celebrating a religious festival, cutting them to pieces. The attack ignited war that led to the empire's ruin.

that he would need to come and stay with the Spaniards. Montezuma was "profoundly shaken," says Gómara, and replied, "My person is not such as can be taken prisoner, and even if I should consent to it, my people would not suffer it."

According to Díaz, Cortés and Montezuma spent more than half an hour discussing the question. Cortés' soldiers grew jittery. "What is the use of all these words?" one of them burst out. "Either we take him or we knife him. If we do not look after ourselves now we shall be dead men." In the end Montezuma went peacefully with the Spaniards.

How was it that the Aztec emperor could have allowed himself to be placed in such a position? Sahagún's informants gave an explanation of the mystery that has endured ever since: Montezuma and the Aztecs thought that Cortés was none other than the ancient god-king Quetzalcóatl, the Feathered Serpent, who, according to religious myth, had been driven from his kingdom vowing one day to return and reassert his rule. Therefore some historians believe that Montezuma was a prisoner of his own mythology. The myth is a wonderful explanation but, as British archaeologist Nigel Davis points out, it "has been rather overplayed in popular accounts." Besides, purely diplomatic protocol provides a reasonable explanation—Montezuma waited for Cortés to arrive at Tenochtitlán simply because it was the Aztec custom that an ambassador was immune from harm.

Or it may be that, as word came of Spanish military and diplomatic victories, Montezuma came to comprehend that these strangers needed to be handled with great care. This, in any case, appears to have been Cortés' view. As Gómara explains, Montezuma "did not wish to stir up trouble for himself (and this was the truest reason)" by offering open resistance to Cortés and thus perhaps encouraging more of his discontented subjects to join the Spaniards in an attempt to unseat his power. He would pursue the strategy of the spider and the fly; he would bring Cortés into Tenochtitlán and informally hold him hostage, in the same way that he customarily held numerous rival chiefs as permanent hostages.

While the Spaniards kept Montezuma in captivity—sometimes, indeed, in manacles—the myth of Montezuma's rule had to be maintained. Each day the Spaniards would ask him what his orders and his wants were, and these were carried out. Sometimes Cortés and Montezuma would sit together and play *totoloque*, a game that involved tossing small pellets of

Appealing to crowd to end fight and let Spaniards go, Montezuma was wounded; he died in Spanish hands.

gold for higher stakes, usually more gold or jewelry.

Eventually, perhaps trying to quench the Spanish thirst for gold, Montezuma agreed not only to open up his personal treasure but to call in gifts from his whole empire and give them to Cortés. The list of what he gave is breathtaking: gold and silver and pearls, golden nose crescents and necklaces, blowguns inlaid with silver, silver plates and cups, pitchers and saucers. There was so much gold treasure from Montezuma's gifts alone, says Díaz, that it took the Spaniards three days just to examine it all.

Soon afterward it appeared that some of the Aztec leaders, tired of seeing their emperor truckling to the Spaniards, told Montezuma that either the Spaniards should leave or the Aztecs should kill them. Aware of the danger, Cortés ordered that the horses be kept saddled and bridled day and night; Spanish soldiers slept in their armor, their weapons beside them.

But just at the critical point—it was May 1520—Montezuma's messengers brought news that another Spanish fleet, captained by Pánfilo de Narváez, had been spotted back at San Juan de Ulúa, where Cortés had originally landed. A picture painted on cloth was brought to Montezuma. There were 18 ships, 80 horses and 900 soldiers.

Cortés greeted the news with an appearance of relief, even joy. However, out of Montezuma's presence he grew "very thoughtful," Díaz says. He guessed that Diego Velázquez had sent the fleet to put a stop to his enterprise, and he sensed the presence of rivals for the Aztec riches as well as a possible split among the Spaniards that the Aztecs might exploit. Cortés left for the coast, taking about 120 soldiers with him and leaving fewer than 100 at Tenochtitlán, under the command of Pedro de Alvarado, a man with the reputation of being brave but cruel.

At Zempoala, Cortés took Narváez's army by surprise at night. Narváez himself got a pike thrust that cost him an eye and was put into irons. Most of his men joined Cortés, augmenting his force with a large and fresh lot of soldiers, including, as Gómara reports, "a Negro sick with the smallpox"—who would, as we now know, turn out to be a very significant figure in the final tragedy.

Back in Tenochtitlán, however, the whole city had exploded in violence. The Indians had been celebrating the annual festival of Toxcatl in the courtyard of the great temple square with "drums, conch trumpets, bone fifes" and other instruments. They were covered with necklaces and jewels, feathers and pearls, and danced in circles, accompanied by sacred singing. In the midst of the dancing the Spanish soldiers abruptly closed off all the exits and, with swords drawn, waded into the midst of the dancers.

"They attacked the man who was drumming," according to Sahagún's native informants, "and cut off his arms. Then they cut off his head, and it rolled across the floor. They attacked all the celebrants, stabbing them, spearing them. . . . Others they beheaded . . . or split their heads to pieces. . . . Some attempted to run away, but . . . they seemed to tangle their feet in their own entrails."

The next day the Aztecs who had not been trapped in the courtyard counterattacked. Full-scale fighting swept through the city, bringing about all of the horrors that Montezuma apparently had feared and labored for so long to avoid. The emperor watched, powerless, as the city, which had thus far been saved from bloodshed, was threatened with disaster. The Aztecs closed off the causeways, destroyed some of the bridges over which the Spaniards might escape and threw up barricades around the palace, hoping to starve the Spaniards out.

Trapped inside the Aztec city

Hearing the news, Cortés at once rushed back toward Tenochtitlán. As he passed through the countryside, he discovered "all the land was in revolt and almost uninhabited." In late June, when he reentered Montezuma's city, he found the streets almost deserted. There was an ominous quiet, as the Aztecs let the Spaniards back into the trap. By next morning, the roads around Tenochtitlán were filled with angry warriors, all of them enemies of the Spaniards. The thousands of Cortés' native allies now seemed to melt away, except

for the few thousand Tlaxcalans trapped with the Spaniards inside the city.

"Such a multitude" of Aztecs now swarmed in to surround the Spaniards' quarters, says Cortés, "that neither the streets nor the roofs of the houses could be seen for them." And soon, so many stones began to be "hurled at us from their slings into the fortress that it seemed they were raining from the sky. . . ."

Wave after wave of Aztecs repeatedly attacked, often running headlong into Spanish guns, cannon and swords. Some tried to scale the walls of the palace. Finally, they shot burning arrows into the fortress, hoping to smoke the enemy out. One whole section of the palace fell, but the attackers never got in.

At last Cortés sent for Montezuma and asked him to go up to the roof of the palace and tell his people to stop the fighting and let the Spaniards leave in peace. According to Díaz, Montezuma mounted to the roof, and a great silence fell over the thousands who swarmed over the streets and nearby rooftops. The emperor begged his people to put down their arms and let the Spaniards go. But, Díaz says, the chiefs replied to Montezuma—"in tears"—that they no longer recognized him as their leader, and they would not stop now until all the Spaniards were dead, "and they begged for his forgiveness."

And then, a shower of darts and stones was thrown at Montezuma. The Spanish soldiers rushed the emperor back inside the palace. But soon thereafter, because he refused to eat or have his wounds tended, Montezuma died.

While most sources agree with this account, some, mostly native sources, say that Montezuma was murdered by the Spaniards back in their palace quarters.

It was now imperative for the Spaniards to get out of the city. In the middle of the night of June 30, 1520, they brought the gold and jewels and silver out into the middle of a hall in the palace. Those who wanted

Fighting their way out of the city during the "night of sorrows," hundreds of Spaniards were shot down or drowned as they struggled to cross the remains of causeway bridges that the Aztecs had torn apart.

After reducing Tenochtitlán to shambles in months of house-to-house fighting in 1521, returning Spanish soldiers wore cloths over their noses to keep out the stench of the dead, done in by sword and smallpox.

some, took it and stuffed it into their packs and clothes. Shortly before midnight, Cortés and his men made a run for it across one of the causeways.

The horsemen went out first, presumably to charge and scatter any Aztecs who might block the way. They were followed by soldiers carrying a makeshift wooden bridge to be used in place of the bridges the Aztecs had destroyed. The retreating Spanish managed to slam the bridge down across the first break they came to. They had caught the Aztecs by surprise, and so a good many Spaniards slipped past the main mass of Indians. But then an alarm sounded—trumpets, cries and whistles—and their retreat became a headlong dash down the causeway. Crowds of Aztec warriors threw stones and spears at them, and, as Díaz says, they had to leave the bridge behind at the first gap.

Trying to get over the next gap without the bridge was a disaster. As horses slipped and fell into the water, cannon and bundles and boxes followed. The Spaniards rushed on from gap to gap, fleeing ahead of the Aztec warriors, braving the improvised gauntlet of warrior-filled canoes on either side of the causeway. Those who had been most greedy about stuffing gold into their clothes were among the first to sink with the weight of it as they crossed. "So those who died," Gómara notes dryly, "died rich."

According to Díaz, there had been 1,300 Spanish soldiers in Tenochtitlán in those last days (much of Cortés' original army, plus Narváez's reinforcements) as well as 2,000 native warriors, mostly Tlaxcalans. Estimates of those killed in the siege and flight from the city range from 450 to 860 Spaniards and 1,000 to 4,000 Tlaxcalans.

The survivors continued to flee, all the way to the city of Tlaxcala, where their strongest allies took them in. For Cortés and the Tlaxcalans, there was no quitting the struggle with the Aztecs.

Realizing that to take back the Aztec capital he would have to attack and seize the city from both the causeways and the surrounding water, Cortés had boats built so they could be carried piecemeal over land and then assembled to operate in the shallow lake waters. In late December of 1520, Cortés reentered the Valley of Mexico, secured the shores of the lake, and destroyed the aqueduct that brought the main supply of fresh water into the city.

In late April 1521 the siege began, Cortés sending his boats across the water, and his foot soldiers down

the causeways. The Aztecs had prepared their defenses by planting sharpened stakes just under the water at the gaps in the causeway. As fighting continued, the Spanish kept filling in the gaps with stones and rubble, but at night the Aztecs reopened them. Once, when the Aztecs took prisoners, they cut off the heads of some and bowled them at the approaching army.

Day and night, the fighting went on. The Spaniards would secure a street, only to find it taken back the next day. At last Cortés instructed his men to advance, slowly and deliberately, removing every Aztec barricade, destroying every Aztec tower and house as they went. The slow, grinding reduction of Tenochtitlán went on for three months, and toward the end the stench of unburied bodies piled high in the streets and rotting in the water was appalling. In the last offensive, so "piteous" was the wailing of women and children, says Gómara, that Cortés urged his men to spare the populace, but they kept on. As the city began at last to collapse, a gush of old men, women and children came flooding out toward the causeways with such force "that they pushed each other into the water, where many drowned."

The end came on August 13, 1521. The few Aztec warriors still alive gathered on the rooftops of the houses that still stood, and "stared at the ruins of their city in a dazed silence." As the Spaniards walked at last down the inner streets of the conquered city, they tied handkerchiefs over their noses to guard against the stench. They went through town, seeing the stagnant and briny water that had served as drinking water in these last days of Tenochtitlán, and the remnants of what the Aztecs had had for food: lizards and salt grasses from the lake, twigs, roots and tree bark.

Among the piles of bodies were people who had died not so much of wounds as of starvation and of various diseases, especially smallpox—the virus that had been brought ashore by the man in Narváez's crew, a virus that had made its way across Mexico with Cortés' army. The populations of the Americas had no resistance to it.

In some regions of Mexico, the mortality rate was so great that the living could not bring themselves to bury the dead. It was said that the Indians, overwhelmed by the task, sometimes pulled down the houses on top of the dead to bury them.

Cortés' story did not end here. Like many other New World adventurers, he went on to great wealth and power. But in the end, accused of murder and mismanagement, he died broken-hearted in Spain. The pestilence that his invasion brought did not end with the death of Tenochtitlán, either. Smallpox and other epidemics spread throughout the countryside, subsided and recurred, subsided and recurred, until, eventually, of a total population of perhaps 25 million, as many as 22 million died.

And with the death of so many, a civilization died—not simply a city or a government or an empire, but most of the accumulated knowledge of life and art and skill, so that, in time, practically all that remained of it were its artifacts and its story of the inevitability, in life and in history, of tragedy, and surprise.

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Buckle up, America!

By Steve Kemper

This beach boy sings a song developers don't want to hear

Orrin Pilkey sounds like a broken record when he says our coastlines can't be tamed, but people are finally beginning to listen

A coastal newspaper, under the headline "Orrin . . . A Plague on Our Land," once gave Orrin H. Pilkey jr. a higher score than Chicken Little in the category of "Shrillest continuing doomsday performance, foretelling imminent ruin, destruction and disaster" and recommended deporting him to Greenland. On another occasion Pilkey so enraged the mayor and town council of Folly Beach, South Carolina, that they passed a special resolution of condemnation, calling his views "insulting, uninformed and radical both in content and intent."

Academic geologists rarely inspire much passion among the general public or attract much attention from politicians. Pilkey is a trouble-making, blunt-spoken exception. A genial 58-year-old who delivers fighting words with a smile, he directs the Program for the Study of Developed Shorelines at Duke University, where he is James B. Duke Professor of Geology. He is also the point man for the scientists and environmentalists who believe that because of the "rush to the shore" that has deposited so many millions of people on the nation's coasts, our beaches and barrier islands are being developed to death, from the Great Lakes to the continental coastlines.

Pilkey's message begins with the geological fact that gives his best-known book its title: *The Beaches Are Moving: The Drowning of America's Shoreline.* Pilkey says that beaches exist in a dynamic equilibrium, responding to storms or a rise in sea levels by slowly migrating—retreating toward the land or, in the case of barrier islands, rolling over on themselves. When people interrupt this movement by compacting and confining sand with roads and buildings, says Pilkey, and further disrupt the flow of sand with groins, jetties and seawalls, they demolish nature's way of maintaining beaches and guarantee their destruction. Coastal geologists had been saying these things for years in professional journals without much notice. Pilkey took the science public, in a torrent of combative op-ed pieces, legislative testimony, books and public meetings.

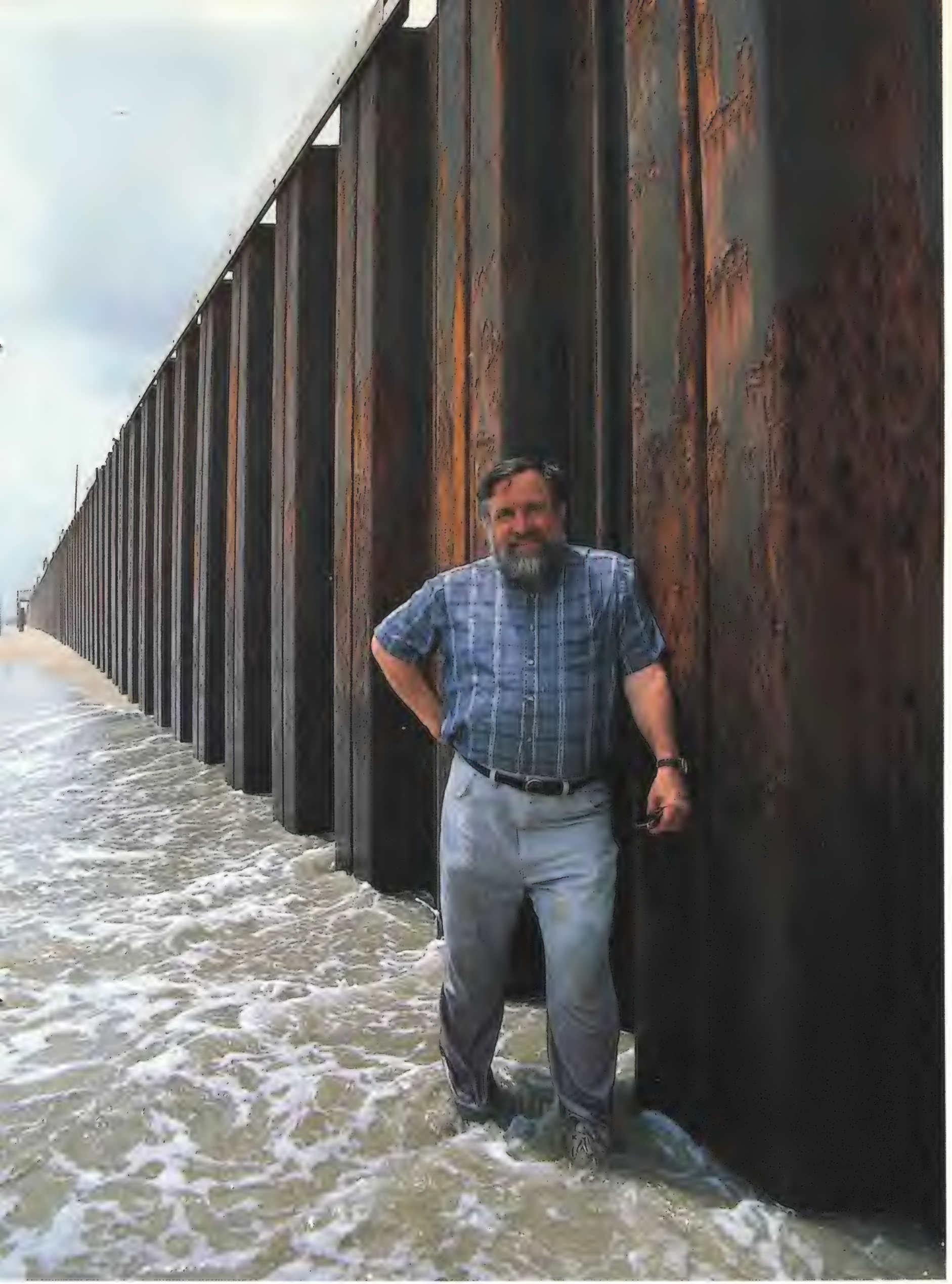
"Most scientists put themselves on a cloud and think they're above dealing with the public," says Stanley Riggs, professor of geology at East Carolina University and occasionally Pilkey's coauthor, "but Orrin enjoys it. He also likes a fight. Not only is he built like a little bulldog, he takes hold of something as if it were a rag doll and just keeps shaking it until there's nothing left. He's done more on a national basis than any hundred of the rest of us."

What puts Pilkey into a hornet's nest of furious homeowners, businesspeople and politicians are his policy recommendations. Retreat from the beach. Prohibit new development. Outlaw seawalls and groins. If an eroding beach threatens a building, force the owner to move it or lose it. If a storm wallops a beachfront house, don't let the owner rebuild, or at least don't provide incentives for shoreline development with federal guarantees of low insurance rates. We can save shorefront homes and buildings for the benefit of a privileged few, Pilkey tells everyone from the U.S. Congress to the North Carolina Beach Buggy Association, or we can save the beaches for everybody.

When he began delivering this message a dozen years ago, the few people who paid attention called Pilkey crazy. Some people still do. But today, influenced largely by his studies and the glare of publicity that he has focused on beaches, North Carolina, South Carolina, Maine and Massachusetts prohibit open-ocean seawalls, and every state except Virginia makes it difficult for anyone who wants to armor a beach. Even Pilkey's archenemy, the U.S. Army Corps of Engineers, now uses "hard solutions" against beach erosion only as a last resort. Congress is considering legislation that reforms the National Flood Insurance Program to limit protection of property in eroding coastal areas.

Pilkey has made beaches a hot topic, but he says he's just warming up. "Coastal engineers are going to be even madder at me before long. Now we're going after some of the main principles and design assumptions behind beach replenishment, seawalls, and so on. I

At low tide, Pilkey leans on a bulkhead in Sandbridge, Virginia, that caused a beautiful beach to disappear.



Chatham, Massachusetts: eroding bluff menaces home.

Nantucket, Massachusetts: house tilts on shifting sand.

South Nags Head, North Carolina: cottages await end.

hope that in 10 or 15 years I will have fostered a revolution in coastal engineering."

Pilkey came to Duke in 1965 after three years at the University of Georgia's Marine Institute and has visited such places as Alaska, Portugal, Colombia and Korea to do research and advise governments on coastal issues. His office is a mess. Most of the time he can root around among the journals, slides, articles, correspondence and empty coffee cups to find what he wants—say, his latest contentious letter to the commander of the Corps of Engineers, or the old clip-on tie that he keeps around "for crises." Shelves hold some of the two-dozen books he has written or edited, including the 17 on various coastal states for the series "Living With the Shore." On one wall hangs the Francis Shepard Medal, the highest honor given internationally for marine geology, bestowed in 1987 for his work on turbidity currents and the way they sculpt the deepwater tablelands called abyssal plains.

"That was exciting stuff," he says of the research that occupied him for 20 years and made his academic reputation, "but nobody cares because it doesn't affect human beings." Several things, including constant seasickness, nudged him from the deeps toward the shore. In 1975, to provide his students with a geology guide for field trips, he, his father Orrin sr. and his brother Walter (both engineers) wrote a simple handbook called *How To Live With An Island.* A North Carolina official liked it and printed it.

"The response was unbelievable," says Pilkey. "I was amazed that with this little effort I could have this much impact." Four years later he coauthored *The Beaches Are Moving,* which created another stir and pushed him closer to shore. By the mid-'80s he had become a full-time coastal gadfly. He says the work sparks him because he "can use principles of geology on real world problems and really do something for mankind."

Pilkey was grounded in 1982 during a field trip with a group of high school students. "I accidentally dove 30 feet from the mast into 6 feet of water and broke my neck. But it paid off," he adds, wagging a finger. "All of those students still remember that dive." The injuries continue to nag him and ended his hobby of running marathons. A tidal delta has been accreting at his beltline ever since, but on field trips he churns down the beach at a pace that leaves many of his students straggling behind.

He lives on 13 acres in Hillsborough, North Carolina,

Steve Kemper says that the beaches in his home state of Connecticut will never seem the same now that he has been enlightened by Professor Pilkey.

Photographed in 1980s, they've long since disappeared.

Westhampton, New York: ocean shows pilings no mercy.

Chesapeake Bay: waves, tides, kayoed beach defenses.

with his wife, Sharlene, who calls him Pilkey. Their menagerie of animals once included turkeys, peacocks, guinea hens, geese, ducks, chickens, dogs and a goat that attacked Volkswagen Rabbits. Everything but the chickens and dogs is gone now, along with the Pilkeys' five children. In the backyard, a hawser tied to the chimney runs down to a 700-pound anchor.

One night last February, despite blowing snow and bitter cold, more than 200 people showed up in Chatham, Massachusetts, at the elbow of Cape Cod, to hear Pilkey speak. Five years ago a winter storm sliced through the barrier island in front of the town, opening an inlet that exposed the inner shoreline directly to ocean waves. Since then the harbor has begun to choke with sand, threatening the small fishing fleet. Waves and storms have taken big bites out of the shoreline. Ten houses have fallen into the sea or been demolished, and 30 more are under siege.

People want to build seawalls to protect their property, but the town rejects most applications, citing regulations. Owners can appeal, but waves and sand sometimes move more quickly than bureaucracies. One homeowner wrapped his house in red tape just days before the ocean ate it. People are worried about their property, their town, their beaches, their income from tourism—their future. They want solutions.

Enter Pilkey. At 5 foot 4 and 220 pounds he is built like a grenade. Bearded, in old gray jeans and a hooded sweatshirt, he looks more like the fishermen in the audience than like the tweed-and-turtleneck townsfolk. He dresses the same way to teach a class, dig on a beach or speak at a chamber of commerce luncheon.

His first slide is of the Morris Island lighthouse, once a beacon on land, now an island some 400 yards into the open ocean outside Charleston, South Carolina. He shows them St. Catherines Island, Georgia, where trees undercut by surf are falling onto the beach. "But there's no erosion problem here because no one has built anything on the beach." He flashes a picture of construction workers fishing from an unfinished high-rise condo in Garden City, South Carolina. "One thing we've learned is that you shouldn't be able to fish from your condo window."

He explains that since beach migration and rising sea levels are inexorable, coastal communities have three choices: "hard" stabilization (for example, groins and seawalls); replenishment of the beach by bringing in more sand; or relocation and retreat. "There's no doubt that seawalls degrade beaches," says Pilkey, flashing slides of fully armored beaches in New Jersey, Puget Sound and Japan, where they have been scoured away by waves smashing against seawalls.

Sand being pumped from a dredge replenishes part of the shoreline at Wrightsville Beach, North Carolina.

By contrast, replenishment doesn't destroy beaches but is expensive and even more temporary. Pilkey thinks it makes the most sense in urban settings—New York City's Coney Island, Miami Beach, Rio de Janeiro. For smaller communities, the economics are more questionable. Ten years ago, Ocean City, New Jersey, paid $5.2 million to replenish a beach; six months later, a third of it was gone. This year, at an initial cost of $39 million, the process is starting all over again. Ocean City, Maryland, got a $14.2 million beach in 1988, spent another $25 million in 1990 and '91 for sand and a seawall, lost its protective dune and part of its beach last winter, and spent another $12 million for more sand this past summer. Still, Pilkey tells his Chatham audience that they may want to consider replenishment, at least in preference to seawalls.

The third possibility, relocation and retreat, is Pilkey's favorite for reasons that mix common sense, science and esthetics. "On the shore, nature always bats last," he says, so coastal communities should begin planning now for orderly retreat. If they choose to fight on the beaches, their retreat will be just as inevitable but far more frantic and expensive. "If the expectations of sea level are realistic," he says, "in the future we won't be worrying about places like Chatham and Nags Head but about Charleston and New York and Galveston."

Nine houses in Chatham were directly opposite the breach. Only two remain—the two with seawalls. John Whelan's house is one of them. "I heard what Mr. Pilkey said about seawalls," he says. "I hate to think that I'm hurting my neighbors, but I didn't feel I had a choice."

"It's an understandably selfish reaction," says Richard Miller, chairman of Chatham's Waterways Committee, whose beachfront house is also threatened. "People say, 'I don't care what the results are, I'm going to save this damn house.' But my wife and I have made the philosophical decision not to revet. We will either move it or lose it."

It was time to haul out the sandbags

Alfred Nelson's summer home, down the beach from Whelan's, is assessed at $1.2 million. Water has crept to within 19 feet of it. Nelson's petition for a seawall was denied three times by the Chatham Conservation Commission. Last year he spent $30,000 on sand and vegetation, but a storm whisked it all away in half an hour, leaving four feet of salt water in his basement and $60,000 in damages. He appealed to the state's attorney general, who in early summer allowed him to fortify his beach temporarily with emergency sandbags, pending a final decision in his suit against the state. So far he has spent about $70,000 on sandbags. If

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the court denies his request for a permanent seawall, he expects his house to wash away soon after the sea claims his sandbags. "So what do I think of people like Pilkey?" he asks. "They're taking our property, and we have a right to protect it."

Nelson is one of several people suing the state. The number of lawsuits surely will rise with the advancing waterline. Yet the powerful appeal of beachfront property ensures that people will continue to manifest what Whelan calls the "greater-fool phenomenon." There will always be buyers, delighted by the lovely views and surf, who don't see a dynamic system pushing back the shore without regard for property lines.

On another day, Pilkey is barreling down Virginia Beach in Virginia, with his arms outstretched as if to embrace the coast. He is leading 35 students, two reporters, and visiting professors from Portugal, Korea, and China on one of his frequent field trips along the Atlantic shore. This one will go south from here to Ocracoke, in the Cape Hatteras National Seashore on North Carolina's Outer Banks. "We will see many of the spectacular atrocities," Pilkey promises.

Near the top of his list is Sandbridge, a wealthy residential section of Virginia Beach. The shorefront residents here own most of the beach to the low-tide mark, which means that Pilkey's parade is engaged in trespassing. He shrugs. "You can't see American beaches without trespassing."

From the beach, Sandbridge looks like a fortress. About 150 of the approximately 200 homes on the retreating shoreline are defended by long stretches of bulkhead, much of it sheets of steel six to ten feet high. Sandbridge's beach is washing away because bulkheads prevent the sand from moving up onto the shore. To stay dry at high tide in summer, sunbathers position their lounge chairs sideways at the base of the bulkheads. Waves have undercut the houses without bulkheads, exposing pipes and septic tanks, and causing stairways to jut into space eight feet above the sand. New houses are going up on the beach. "Look," says Pilkey, pointing to a three-story castle 100 feet from the high-tide line. "They're just washing the labels off the windows. That is insane."

At the end of the walk, Pilkey's group bumps into George Owens, owner of a beachfront house and president of the Sandbridge Oceanfront Property Owners Association. Like most people in Middle Atlantic beach towns, Owens recognizes Pilkey and has seen his PBS television special about beaches-on-the-move.

"It's depressing to sit there and agree with you, hearing the waves slap up," he tells Pilkey. "I don't want to be like New Jersey with the entire coast ar-

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Beyond pier, groins on a beach in Asbury Park, New Jersey, trap offshore sand moving from south to north. Sand builds up on the groins' south side as it erodes on the north side, and thus one groin begets another.

mored, but I do want to live on the ocean." He doesn't think the narrowing beach is related to the bulkheads and cites some coastal-engineering reports.

Up to now the beachfront owners in Sandbridge have paid for their own protective measures—$8 million over the past ten years. Now Owens says they desperately need a proposed $6 million to $9 million replenishment project that would be funded by Virginia Beach and U.S. taxpayers. "Sandbridge generates over $3 million in tax revenues each year," says Owens. "Shouldn't you protect that?"

This is the sort of situation that winds Pilkey up. "Those people caused the problem by putting up bulkheads. As long as the bulkheads are there, the beach will have to be replenished every few years, and those people should pay for every cent of it themselves." As for engineering claims that seawalls are innocent, Pilkey retorts: "Ludicrous!"—a favorite adjective when discussing coastal engineering.

At 7 the next morning in Nags Head, Pilkey is already wet. "We've got a real storm," he says, raising his arms like an exultant boxer. "Come out and see science in action. It's beautiful out there." It's a gray day of driving rain, with wind gusts on the beach sandblasting the skin off faces and ears.

Tsung-yi Lin, Pilkey's graduate student from Taiwan, is setting up traps to measure how much sand the wind is moving. Lin explains that this can be affected by the beach's vegetation and topography; the sand's grain size, wetness or dryness; and the wind's speed, direction and duration. These variables combine differently every hour of every day. Yet, Pilkey says, engineers rarely consider the fact that wind carries large amounts of sand onto and off the beach. Lin and Pilkey think this is a serious omission.

Pilkey is convinced that the movement of sand—whether on the beach, in the surf zone or on the near shore—is far too complex and unpredictable to be captured in mathematical equations. Yet such equations are the basis of coastal engineering, which is used to justify and fund beach projects. For example, Pilkey says the Corps of Engineers overestimates the life spans of replenished beaches and hence underestimates their long-term costs. The Corps says that its replenished beach at Sea Bright, New Jersey, will need more fill in six years; Pilkey says one to three years. For Myrtle Beach, the Corps says eight years; Pilkey, three to five.

The Corps disputes Pilkey's numbers and findings. "Orrin has an idea of the coast and how it operates, and it's become a religion with him," says Jim Houston, director of the Corps' Coastal Engineering Research Center in Vicksburg, Mississippi, and author of several

It was an unlikely alliance.

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It was an unlikely alliance. But when five state governments, two wildlife conservation groups and one energy company came in with concern and came out with solutions, it seemed more inspired than unlikely, after all.

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recent articles criticizing some of Pilkey's methodology. "You have to be careful you're not using your religion to do science."

Pilkey bristles at charges of sloppy science. But the larger point is that whenever coastal geologists and coastal engineers talk about the shore, they seem to be describing different places. This complicates the public debate, since both sides can easily line up experts whose conclusions are totally at odds.

Pilkey certainly has ample proof that engineered "solutions" often worsen the problem or cause new ones. Thirty years ago the Corps of Engineers spent ten years and $32 million to turn Florida's flood-prone, serpentine Kissimmee River into a neat canal. That led to suffocation of the ecosystem in the surrounding 75-square-mile river basin. Now the Corps intends to put the kinks back in the river, at a cost of $370 million over 15 years. In South Carolina, the jetty that keeps Charleston Harbor open is starving downshore beach communities of sand. And the Corps' groins that have preserved the beaches on the eastern end of Westhampton, Long Island, have caused severe erosion at the western end, leaving a number of Westhampton houses in the surf. The property owners victimized by these examples of governmental mistakes, however, do not get any sympathy from Pilkey. "If we began to pay people for all the Corps' mistakes on the shoreline," he says, "it would destroy the federal budget."

This attitude separates Pilkey even from some of his allies. Says Joseph T. Kelley, a professor at the University of Maine, the state's marine geologist and a good friend of Pilkey's, "I agree with most everything he says. But I work for the state government, and when people's homes get washed away, they're at my front door the next day crying. I don't think Orrin has ever had to deal with people like that. They're real people feeling real pain. So I differ in how I handle the subject, though not in the conclusions."

Pilkey's parade moves down the beach, past a solid line of houses and hotels, to South Nags Head. In North Carolina, sandbags may be used as a temporary measure, but the state prohibits seawalls and other hard solutions, and many people here who formerly lived in what was the second row of houses now have an unobstructed ocean view, courtesy of a recent storm. A few condemned houses totter on crooked stilts at the tide line, testimony to the fact that armoring or no, the sea is going to go where it wishes. "Here you see the results of North Carolina's anti-armoring policy," Pilkey tells his students, gesturing at the gaps in the neighborhood and the doomed houses.

That night, Pilkey runs into Willie Etheridge, an old foe who heads the family fishing business. A burly, powerful man with a ruddy face, Etheridge berates Pilkey once again for opposing the Corps' plan to stabilize nearby Oregon Inlet with massive jetties. The Corps has already built one structure on the southern side of the inlet. Until the Bonner Bridge spanned it in the mid-'60s, the inlet was steadily moving south. To maintain a channel for fishing boats, the Corps must thwart the inlet's ceaseless urge to move on. At the moment, that costs more than $8 million a year for dredging. Pilkey and other scientists believe that the Corps' plan for jetties, which has been rejected several

Threatened by erosion, famous Cape Hatteras lighthouse in North Carolina is slated for relocation 1,500 feet inland. The National Park Service awaits funding from Congress.

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Property owner surveys extensive damage inflicted on South Carolina shore by Hurricane Hugo. Such a catastrophe dramatizes Pilkey's point that wind, waves and water cannot be controlled by people.

times but is under review again, would cause severe damage to beaches downshore. This would be an economic boondoggle, Pilkey says, costing millions for maintenance and beach repair. Etheridge doesn't believe it and asserts that other jetties on the Atlantic coast "are all working today with no damage."

"Look at Florida," counters Pilkey. "The most jettied place in the country, and every one of them is causing erosion. Every single one, without exception. A jetty at Oregon Inlet is too big a risk."

"My father says, 'Dr. Pilkey's name should be Dr. Maybe, Dr. Could Be or Dr. Possibly," says Etheridge.

Pilkey winces but nods. "You have to be that way sometimes, as a scientist."

"Let me tell you a story," says Etheridge. "I was talking to a fisherman the other day and he said, 'Every time I go through Oregon Inlet my throat gets so dry I'm afraid if I don't have a cough drop in my mouth I won't be able to call for help if anything happens.' If we had that jetty, the inlet would be safe, and he wouldn't have to worry about it." He stares at Pilkey, then shakes his head. "I once heard Dr. Pilkey asked whether he would take all the houses off the shore if he could, and leave it the way it was before—and he said yes."

"I think you're probably quoting me accurately there," says Pilkey.

Pilkey chews on the conversation for the rest of the trip. "The chief coastal engineer of the Corps in North Carolina once said in a public meeting on Oregon Inlet, after I and other scientists had already talked, 'You've been hearing a lot of probablys and maybes. The Army Corps doesn't give you probablys, we give you facts'—the implication being that they know exactly how the shore behaves. Pure nonsense."

The pretense of certainty is one of Pilkey's main gripes about coastal engineers, exemplified for him by the fact that they don't use error bars when estimating the longevity and costs of replenishing beaches. "Yes, scientists should have error bars," says the Corps' Houston, "but if you're voting for something in Congress, you don't want to know plus or minus how much it's going to cost, you want a figure." Counters Pilkey, "If science can't make a prediction, science *shouldn't* make a prediction."

Not far south of Oregon Inlet, Pilkey stops to fume about a new wall of sandbags running for a mile or so between the ocean and Highway 12, the only road onto and off Hatteras Island. Until recent years the road was behind an artificial dune. Wind and waves have gradually shaved the dune away, and now winter storms regularly breach it in places, flooding the highway and leaving behind heaps of sand. North Carolina wants to save the road. Pilkey, however, takes the island's perspective. He says that it is responding to the threat of rising sea level by overwashing in preparation for migration, and that the road should be moved to the back of the island or replaced with a ferry service.

"Why are we making one of our last natural barrier islands into an engineering project?" he asks his students, though this natural island featured a man-made dune to the highway's east and has a series of man-made duck ponds to its west. Pilkey says that eight communities to the south depend on the highway as an escape route during hurricanes, so they might disagree

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with him. "But where does this lead?" he asks, gesturing toward the sandbags. "Are we going to have a wall all the way down the Outer Banks?"

Next stop, Cape Hatteras lighthouse. In 1870 it was 1,500 feet behind high tide; now it is fewer than 200. It is protected by a series of groins and a mountain range of sandbags, dotted today with sunbathers who don't seem to mind that the beach is nearly gone. Pilkey is excited because the National Park Service has decided to move the lighthouse inland which, he says, sets a good example of using retreat for coastal management.

But what about densely populated coastal communities? Does Pilkey really expect Ocean City, Maryland, or Sea Bright, New Jersey, to abandon their houses and high-rise hotels, their income from tourists and taxes?

"No, but they do need to face up to what it's going to cost," he answers. "Once they know it's going to cost $2 billion to replenish their beach for the next 50 years, then they can decide whether it's worth it, and they can put into effect things that could move them back in 30 years. Sea Bright has long since spent more than the value of the community to save the community. At what point does it become sort of stupid?"

People in most coastal communities are likely to respond much as Robert Linville, mayor of Folly Beach, South Carolina, does: "Pilkey is advocating abandoning the homes we've had here for many years. The hell with that."

But Beth Millemann, executive director of the Coast Alliance, a national conservation group, finds Pilkey anything but unreasonable. "If he was saying these things about people who wanted to build on the edge of a volcano, nobody would question it. But since he's saying it about a subject with a lot of money at stake, some people call him crazy."

Meanwhile, Pilkey is off on another field trip, this time to unpopulated Shackleford Banks in North Carolina's Cape Lookout National Seashore. "It's the most beautiful island in the world," he says, standing on top of a dune, "but the wild horses on it are killing the estuarine side by eating all the spartina. Now if only we could bring in some cougars," he says, rubbing his beard with a mischievous grin, thinking about beaches, looking for a fight.

At high tide in Folly Beach, South Carolina, waves slam against rocks, retainers and groins put in place by homeowners in hopes of preserving shore. A costly beach-replenishment project is due to start next month.

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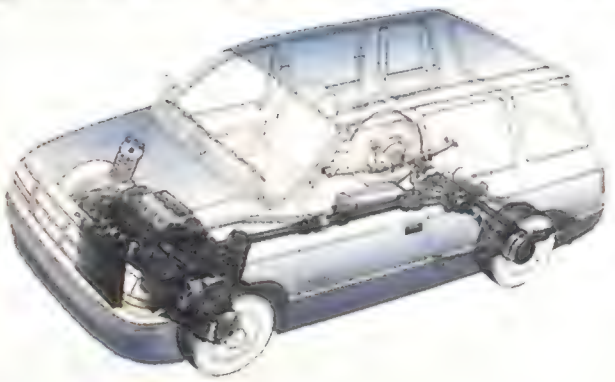

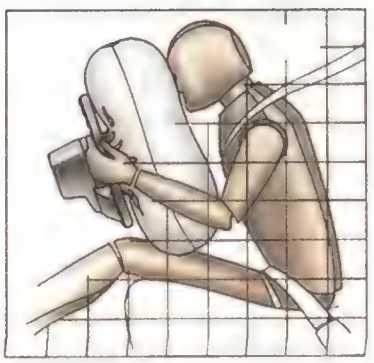

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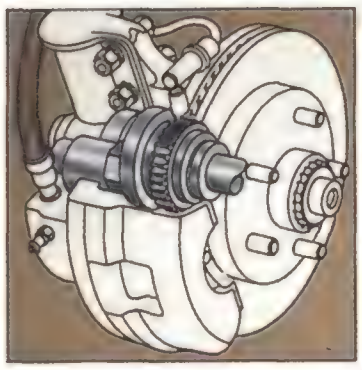

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Photographs by Rosamond W. Purcell

When the human urge to collect takes over a life

Some of the world's greatest natural history collections are the legacy of single-minded people as diverse as the objects themselves

Russia's Peter the Great collected everything: here, an eye constructed of glass, antler bone and metal.

Great natural history museums are judged not by the impact of their exhibits but by the breadth and depth of their collections, the sometimes millions of objects hidden from public view in file drawers and glass jars. It is from these collections that many of the great truths of biology, including the workings of evolution itself, are extracted by scientists. The building of such collections takes money and time, but most of all it takes the passion of collectors across the decades.

Some of that passion exists in almost all of us, whether it be focused on stamps, old bottles, baseball cards or cast-iron tractor seats. Think of almost any class of object and you can bet the rent that there are societies and publications dedicated to collecting it. The very word "collectible" has bought its way into the language at uncountable shows and auctions.

Natural history, to get taxonomical for a moment, has always been in a class by itself. Who can resist a pretty shell on the beach? A bright feather on the trail? A shed snakeskin? Many a youngster has pressed leaves and pinned butterflies before moving on to other interests. Birders collect all their lives, but now only sightings for their life lists instead of the birds themselves with a shotgun.

The passion to collect has as many energy states as an electron orbiting a heavy nucleus. What is hobby for the many becomes lifelong mania for the few, those people who are unable to do anything else, even conceive of doing anything else. Nowhere is this truer than in the field of natural history, in which many of the great collections are the work of extraordinarily single-minded individuals. Now the photographer Rosamond Wolff Purcell and the Harvard paleontologist and writer Stephen Jay Gould have collaborated on a book, *Finders, Keepers,* that celebrates eight of those collections. It follows an earlier look behind the scenes entitled *Illuminations: A Bestiary* (SMITHSONIAN, September 1986).

These photographs from the new work sample the highlights of collections spanning centuries, from that of Peter the Great of Russia, who did not hesitate to add to his collection by personally pulling a tooth from anyone who took his fancy, to the trove of Walter Rothschild, who employed more than 400 collectors throughout the world, with special attention to the birds of paradise. The collections also include the work of a German doctor who volunteered for duty in the Dutch East Indies (and found a post in Japan when it was still closed to Westerners) and of an English amateur who made a living by selling fossils to scientists.

We have the drawings of Agostino Scilla (1629-1700) and photographs of the actual objects. We see the brain casts made by Eugène Dubois (now remembered for his discovery of Java man), who studied cranial cavities and devised an erroneous theory of evolution concerning

A German doctor managed to collect these raccoon dogs in Japan while it was still closed to Westerners.

the relationship of brain size to body size. Finally comes the man Gould calls the dominant figure of 19th-century American biology, Louis Agassiz, whose collections were the foundations for the Museum of Comparative Zoology, where Gould now works.

The collecting passion transcends normal human hierarchies. We see Peter the Great deferring to the Dutch anatomist and preparer Frederik Ruysch; English paleontologists carefully crediting Mary Anning of Lyme Regis, a carpenter's daughter, who had found the ichthyosaur fossils on which they were writing; the fabulously wealthy Rothschild waiting at the door until one of his curators noticed him and invited him into the room.

Gould uses the collection of another Dutch taxonomist, Willem Cornelis van Heurn, to defend taxonomy against sneers that it is only a form of stamp collecting. Van Heurn, too, lived for years in what were the Dutch East Indies, but spent the last part of his career collecting moles and domestic animals at home in the Netherlands. Gould concedes he was an extreme: "the hyperacquisitive finder and meticulous keeper." He admits that van Heurn, who died in 1972 at the age of 85, might be criticized today both by animal-rights activists and by statisticians who emphasize the quality of samples rather than sheer numbers (earlier in the chapter, Gould says: "The science of statistics is dedicated to the proposition that you really don't have to get them all").

All those flattened moles, prepared in exactly the same way, were collected to show the variety among individuals (the colors of the coats and the numbers of teeth, in this instance) that is the driving force of evolution. We humans can only comprehend the infinite variety of nature, Gould says, by "ordering and classifying, separating and comparing." Van Heurn went to extremes, even by the standards of his day. But is that bad? "If we value the diversity of natural objects, then we must also cherish the varieties of honorable human behavior," Gould argues.

In her afterword, Purcell writes that she has "long been drawn to natural history and anatomical collections," that she is intrigued by "classification, juxtaposition of words and objects, the relationship of the collectors or curators to their collections, in short, the grey area between a rational scientific system and human idiosyncrasies."

John P. Wiley jr.

Trunkfish from the Tradescant Collection at Oxford is one of the few surviving specimens from centuries ago.

On one trip he was allowed to make in Japan, Philip von Siebold recorded this giant salamander.

Fossil from Lyme Regis is one of 20,000 specimens studied by Louis Agassiz for a monograph on fish.

Green turtle skulls are in collections of Museum of Comparative Zoology organized in 1859 by Agassiz.

The second monograph in his proposed ten-volume natural history of the United States was on turtles.

Juxtaposition of deformed apple and preserved hand from Leiden suggests eclecticism of the collections.

To store his smaller brain casts, Eugène Dubois used cigar boxes, indispensable equipment for collectors.

Willem van Heurn prepared and organized dog skins in precisely the same way to facilitate comparison.

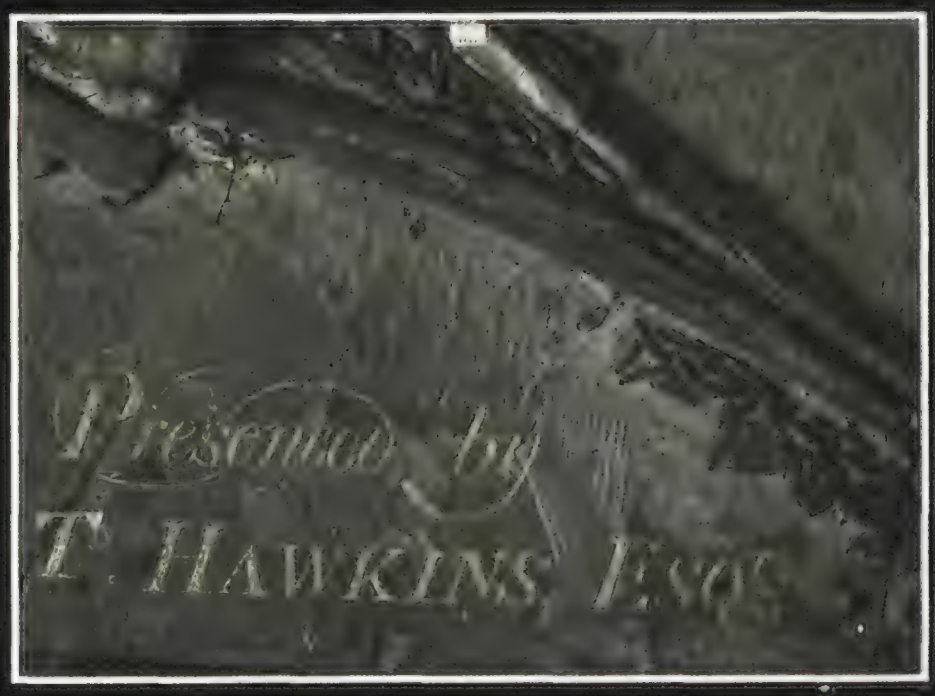
The taxonomist's reputation for frugality would seem confirmed by reuse of envelope to store a rat skin.

The *Finders, Keepers* title-page collage of crabs and shells with a decaying manuscript suggests the cabinets where early collectors stored their treasures.

The drive to collect and classify has been extended to include even such oddities as these deformed but carefully marked eggs.

The actual sharks' teeth are here matched with the drawings of them published in 1670 by Agostino Scilla.

Thomas Hawkins laboriously chiseled stone away to reveal the snout and loose teeth of this ichthyosaur.

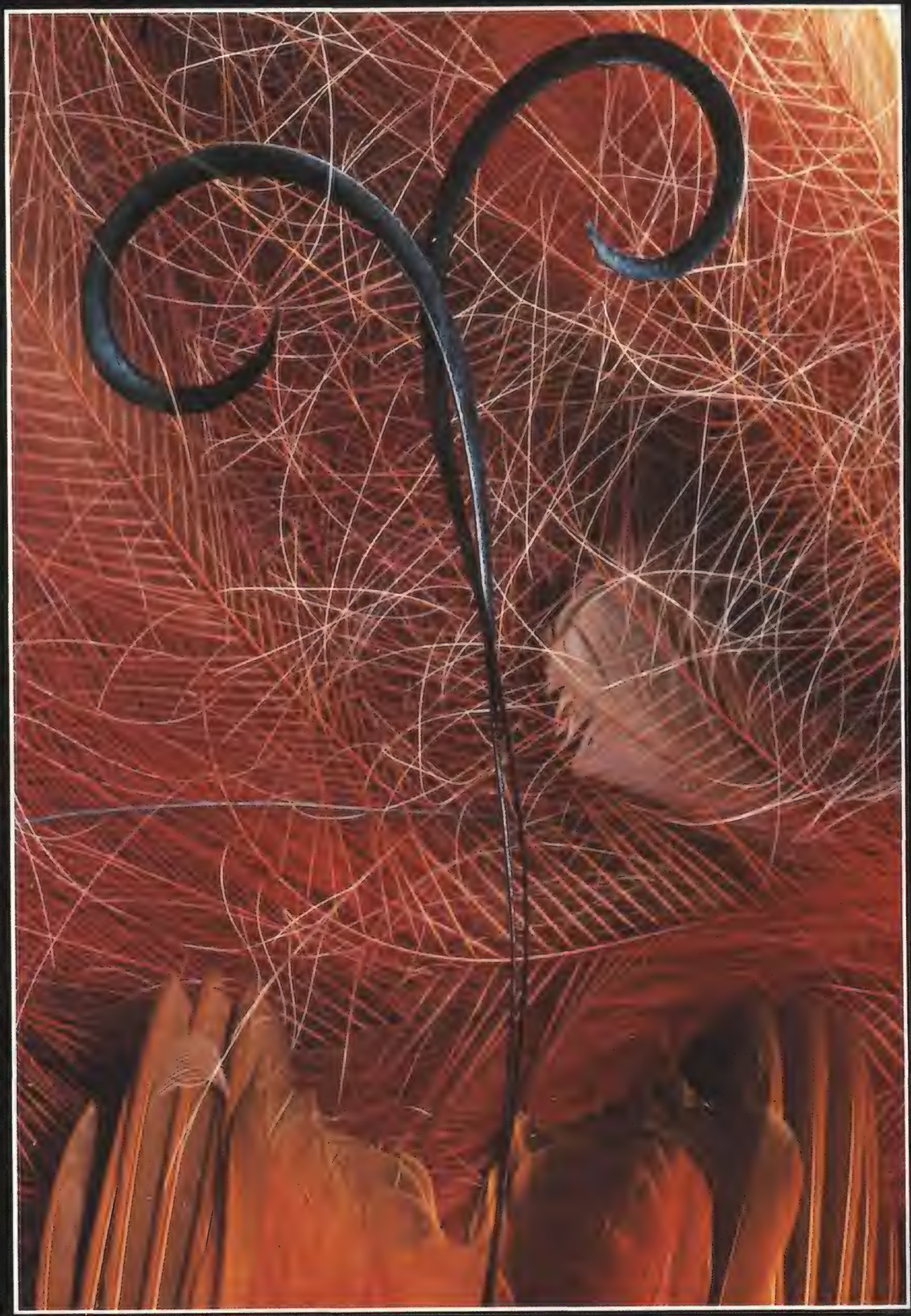


Human teeth personally collected by Peter the Great included ones from a bishop and a "fast messenger."

Flattened moleskins form an almost abstract pattern in a sample of van Heurn's work in the Leiden museum.

These curved central tail feathers, bare for part of their length, belong to a hybrid bird of paradise.

Iridescent feathers rest on plumes of related species, from Walter Rothschild's collection.



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Fixing his sights on a shot, Herbert Bayard Swope jr. stretches out on a manicured court, setting up for the kill during summer competition held on grounds of Champs de Soleil, an estate in Newport, Rhode Island.

By Richard Wolkomir

With mallets and forethought, croquet is back

From backyards to country manses, we while away hours in pursuit of a sport that celebrates green lawns, strategy—and civilized aggression

Croquet was once banned in Boston for being sexy. But that is misleading: the game really is about dealing your opponent a deathblow.

Consider the "send." Anyone who played croquet as a kid knows the green lawns and the cicadas buzzing in the elms were just staging. The drama's nasty heart was bonking an enemy ball with your ball, so you could "send" it. You set your ball touching the bonked rival. You stepped on your ball with a Ked. Then (grinning) you whammed your ball with your mallet, sending the rival ball (maybe your brother's) rocketing deep into the hydrangeas. How sweet it was!

Even better: you'd knock your ball through all the wickets, making it "poison." Then, any other ball it touched, it killed. You were . . . the Terminator.

Croquet is resurging. For one thing, aging baby boomers are getting too huff-and-puff for handball. Also, these are hard-nosed times. We swim with the sharks. Croquet fits the zeitgeist because it is a strategy game. Also, it is about rubbing opponents' noses in their goofs.

A friend clued me in to croquet's new éclat. To buy a

Photographs by Patrick Ward

croquet set for her father's birthday, she said, she hit every discount store in two counties until she found the last unsold set. In 1990 the game's new popularity prompted the National Sporting Goods Association to begin keeping records: 8.2 million Americans now play at least twice yearly. The largest U.S. croquet-gear maker, Forster Manufacturing, of Wilton, Maine, maintains Pentagon-style secrecy, but it does acknowledge that, over the past decade, its croquet-gear sales doubled.

Meanwhile, zeal is rising for croquet's "sport" version, played with no-prisoners rules, serious mallets and an in-your-face attitude. Since the U.S. Croquet Association was founded in 1977, membership has climbed from 5 clubs to more than 350, with a new club signing on every week. University of Massachusetts students take croquet for credit. At Yale, it is a popular sport, played on Astroturf.

I wanted to try this tough-guy croquet, having swung a mean mallet myself back in the era of VW vans sporting peace symbols. We had just moved to the country, didn't have an extra dime, and hit upon croquet as a funky way to amuse friends without springing for a major potlatch. A backyard croquet set from the hardware store cost under 10 bucks (now it's 20 or so), and players contributed tabbouleh and whole-grain rolls. Our lawn was weedy, all ups and downs, so we played "obstacle" croquet, with wickets hidden behind sugar maple roots and upthrusts of slate. Balls hit downhill splashed into the pond.

In Montpelier, an old-time croquet bash

Those games were long ago, sometimes played into the night with flashlights. Before trying "sport" croquet, I needed to swing a mallet again. And so when I learned that every summer a historic preservation group in Montpelier, Vermont, treats the town to an old-time croquet bash, I decided to go. I found a big crowd on the state Capitol's lawn, watching a dozen simultaneous croquet games. It was a mellow Sunday afternoon. Sunlight slanted through the maples, and the city's band tootled on a porch. While I waited for a turn at the wickets, I checked out the competition.

Many of the croquet players wore period costumes. Pioneer women shot wickets in lace caps and log-cabin frocks. That era was pre-croquet, but no one was a stickler—one frontier female wore a nylon fannypack and carried a Nikon. Meanwhile, top hats, straw boaters and feathered millinery concoctions bobbed in the crowd as Victorian gents and ladies bonked their balls, competing for free Ben & Jerry's ice creams.

My opponents turned out to be five good-humored thirtysomethings. But as our game got on, they showed their canines, as my on-the-spot notes reveal:

"The game's almost over. Two of us are poison—Steve Faust (red-bearded, an energy and solid-wastes consultant) and me. Two other players are left, both languishing. We poisons can bonk them to croquet heaven. I'd twirl my mustache, if I had one.

"Steve readies a death shot for Mary Alice Favro (preppy speech pathologist). She's desperate. I don't like the crafty look she's giving my green ball.

" 'Richard's been *awful*!' she tells Faust, shooting me a theatrical dark look. 'You should go get *him*!'

"He sights on her orange ball. Doctor Death.

"Mary Alice dances protectively in front of her ball. But it's too late. Whap.

"Now it's between Faust and me. Sandi Adams, a college mediation director and a descendant of 'John Adams and all those other Adamses,' is cannon fodder, stuck in front of a wicket far down the court. I swat my green ball at her yellow ball. But it hits a bump, hops over Sandi's ball—through the wicket! Wickets kill poison balls, like silver bullets zap vampires. I'm a goner. Curses!

"Chuckling like Beelzebub collecting a soul, Steve fires at Sandi. But his black ball blunders through a wicket, too. Sandi—the game's caboose—wins. 'Slow and steady wins the race,' she says (smug). 'It was tough, but you fell for the bait!' "

Less formally attired players brave wickets weekly at farmer Joe Clark's Tolland, Massachusetts, field.

In mad Queen's surreal match, Lewis Carroll's Alice takes up quirky gear: hedgehog balls, flamingo mallets.

After our game ended, I kibitzed at an adjacent game. Here, the winner was Helen Myers, wearing a black dress her great-aunt Julia ordered from Paris in the 1890s. She said she began playing as a child, during World War II, on her grandfather's farm. "We had several courses set up—one was like a golf course on a hill, with a rosebush and a stoop as obstacles." At a recent university picnic, she practiced old-time sending: "I took one fellow's ball and drove it *so far* into those botanical specimens!"

Joie de croquet. But it's not entirely wolfish. Part of the appeal is childhood memories of red and blue balls rolling across ultragreen lawns—they don't make chlorophyll like they used to. A collie barks. Uncle Doug cheats. It all seems as American as the Fourth of July. But we got croquet from Britain. The mystery is, where did the British get it?

Some historians trace it to *paille-maille*, a game French villagers played as far back as the 13th century. It was croquetlike, played with mallets, wooden balls, pegs and hoops. But that's all hypothesis. In the 1867 book *Croquet As Played By The Newport Croquet Club*, the author (modestly identified only as "one of the members") put it like this: "The origin of the game is unknown. No man invented whist or chess, and croquet like them seems to have been evolved by some process of nature, as a crystal forms or a flower grows—perfect, in accordance with eternal laws."

Eternal laws aside, around 1851 the Irish played a game (apparently from France) called "crooky." By 1852, English blue bloods had taken up the bonking of boxwood balls on their manor lawns. They called it "croaky," and a contemporary engraving depicts the players as well-dressed frogs. Victorian women were enthusiasts because croquet let them exercise outdoors and compete equally with men. Youths also liked it: they could hit ("roquet") a pretty girl's ball, which gave them license to send ("croquet") it into the shrubbery. Then they could gallantly help her look for it.

The game was a hot subject for artists, too, from

Still brushing up on his croquet at home in Vermont, Richard Wolkomir spends too much time as roving reporter to get really good.

Harpo Marx, who played with legendary recklessness, accumulated an equipment stash worth $50,000.

Victorian-era Americans adopted croquet with passion: 1870s engraving touts it as a tonic for young and old.

Winslow Homer to Edouard Manet, and the venue for a show of Victorian fashions. Women wore wire "anti-Aeolians" to keep their voluminous skirts from blowing about. Debates raged over whether to allow two-handed shots, since that would be unfair to the ladies, who also had to hold their parasols.

Britons transported their fashionable sport as far off as India, often playing into the tropical night with candles burning on each peg and hoop. An army surgeon described an 1865 game with the British viceroy: "So keen was he that one evening he would not break off for dinner until the game was finished, the hungry guests gazing at us from the windows."

Inevitably, the bopping of balls through hoops would attract cranks. And croquet got a prime specimen in Walter Whitmore Jones. Born in 1831, Jones—an Oxford dropout—having deemed his civil service boss "under me," quit to market games he invented, like the "Chinese Imperial Game of Frogs and Toads." No luck. Living on handouts from his brother, he changed his name to "Walter Jones Whitmore" and tried (without success) poetry, novels and some 60 inventions, such as the "Bootlace Winder." Finally, around 1860, he discovered croquet.

Whitmore compiled croquet's first standardized rules. He formulated croquet tactics. He got the All-England Croquet Club going, squabbled and started the rival National Croquet Club. In 1871, after the members expelled him, he formed yet a third group, the Grand National Croquet Club. Whitmore died at 41, but he did leave his mark because today he is known as the father of modern croquet.

He bequeathed eccentricity to croquet. In 1865 Lewis Carroll's first *Alice* book captured the spirit in its Queen of Hearts' croquet meet. Live hedgehogs were the balls, bent-over playing cards were the hoops, and floppy flamingos were the uncooperative mallets. "The players all played at once, without waiting for turns, quarrelling all the while, and fighting for the hedgehogs," wrote Carroll. "And in a very short time the Queen was in a furious passion, and went stamping about, and shouting, 'Off with his head!' or 'Off with her head!' about once in a minute."

In 1875 the All-England Croquet Club set aside a

Opponents converge on Vermont Capitol grounds for Montpelier Heritage Group's fancy-dress tournament.

lawn at Wimbledon for an amusing new game, tennis. Eventually, tennis would become the superstar sport. But Wimbledon's official name remains the All-England Croquet and Lawn Tennis Club, a reminder of croquet's onetime hold on Britain's leisure class.

In the United States, the game took a different course. For one thing, croquet's chief requisite is a lawn. In this country, with its small towns and empty acres, owning a lawn was no big deal. Any householder—farmer, lawyer, feed-store clerk, lobsterman—could set up a croquet course, and lots of them did. Descriptions of croquet in novels such as *Little Women* helped. Also, by the mid-19th century the idea of summer vacations took hold, and railroads made it easy for city people to get out into the country, where a favorite pastime was croquet. By the 1890s croquet was linked with gambling, drinking and philandering, and not just in America: Tolstoy had Anna Karenina tryst with her handsome Vronski at a croquet game. In Boston, preachers banned croquet. An 1898 article gave the rationale for drastic measures: "The male antagonist becomes a creature too vile for language, the decency of womanhood has disappeared by the third hoop."

Still, notables such as Mark Twain whacked croquet balls. In 1900 and 1904 croquet was in the Olympics. And in the 1920s the glitterati took it up. Croquet matched the Hollywood temperament. As playwright Moss Hart said of producer Darryl Zanuck: "He has the true croquet spirit. He trusts no one but himself; never concedes—no matter how far behind he may be—and hates his opponents with an all-enduring hate."

Harpo Marx invited show girls up to his New York apartment to see his climate-controlled mallet room. His autobiography describes a croquet game at the estate of millionaire Otto H. Kahn, where Harpo began swinging his mallet like a golf club: "The other three gleefully joined in the experiment, and the croquet balls went zooming all over the place. Garden furniture got knocked over. Greenhouse windows were smashed. Servants ran the gauntlet from main house to guesthouse with arms clutched over their heads. Kahn himself fled to his yacht, which was anchored in the Sound at the foot of the lawn, and hoisted a white flag. He didn't emerge . . . until nightfall, when the world was once again safe from croquemaniacs."

"Croquet is not for sissies"

Mystery writer Rex Stout said he tried all sorts of sports—"baseball, bumblebee raiding, football, rattlesnake snapping, tennis, polo, skiing, and others"—but faced death only twice. Once was on the Kansas farm where he grew up: "In 1896 two of my sisters, claiming that I had jumped a wicket, came at me with mallets and chased me up a tree, and a limb broke." The second time was in 1937 when he knocked Alexander Woollcott's ball into a blackberry bush: "He picked up my ball and hurled it at my head from ten feet. Croquet is not for sissies."

Woollcott habitually explained: "My doctor forbids me to play unless I win." His games with Dorothy Parker, Robert Benchley and other Algonquin wits often got nasty. Harpo Marx, playing against Woollcott, once sawed a tire in half, then placed the halves around a tree to help him make a trick shot. The rules didn't mention tires, so that time Woollcott could only fume. In Los Angeles, movie mogul Sam Goldwyn once tried to stifle actor Louis Jourdan's expert playing by dotting his court with sand traps.

Since the 1970s croquet's popularity has been rising again, even in China, where retired government officials reportedly play croquet on clay basketball courts. When he was the U.S. Ambassador, Averell Harriman introduced croquet to the USSR, where researchers prescribed the game as a calming therapy for returning cosmonauts.

Gorged on such croquet lore, I was ready to try the

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big-time game. I went to Newport, Rhode Island, for a New England regional meet from which winners would go on to the national championships. I saw right off that this game is a different animal from the scruffy backyard croquet I'd just played in Vermont. We'd played that game on the Capitol's shaggy lawn. Players had worn whatever; the atmosphere was casual. This tournament, on the other hand, was in the Newport Casino, a posh tennis club where the pros competed, and the close-cropped lawns looked as smooth as billiard tables. Yet players grumbled that these grass courts were too crude for serious croquet.

The players and spectators dressed in white, like Good Humor vendors, down to their white shoes, white socks and floppy white hats or straw panamas. Nobody was goofing around. When I walked into the Casino, a sixtyish Wall Street CEO with a commanding belly was more or less prone on the grass, sighting along his mallet. The only sounds were a hushed murmur from the crowd and sharp thwacks as wooden mallets hit one-pound balls.

I'd always played with wobbly wire wickets, but these wickets were sturdy iron. They were cruelly narrow: balls squeezing through had only a dime's width to spare. Players said that sunshine can swell a black ball enough to jam it in a wicket. The mallets were long-handled, so you could swing without bending, and almost as heavy as sledges. Britain's first croquet firm, Jacques, is still the chief maker of these classy mallets. During World War II, Jacques sent croquet sets to troops in POW camps. Some U.S. craftsmen now make hand-turned mallets, as carefully balanced as golf clubs and tennis rackets. They cost $85 to $350 or more, if you want to buy one.

Everything was confusing. I had always played croquet on a court with a wooden peg at either end and nine wickets arrayed between them. But these courts

A player lines up a shot in the final moments of a match at aficionado Bert Myer's New Hampshire home.

Referee Bob Kroeger scrutinizes player Peter Hull's jump shot at Woodstock, Massachusetts, tournament.

Myer says creation of 105-by-84-foot court required "ten-wheeler trucks, bulldozers, 15 cases of beer."

Just about to bonk another ball into oblivion, an intent competitor takes aim, at Woodstock match.

had only one peg, in the center, with six wickets arrayed around it. The idea, I learned, was to hit balls through all six wickets, then back again in the opposite direction, ending at the peg. Each wicket has two names, depending on which way you are headed. For instance, the first wicket of the game, "one," is called "two back" on the return trip. But the return-trip wicket that should be called "five back" is instead called "penultimate." And the final wicket is "rover."

Any number can play backyard croquet (who cares?). But here in Newport, games must be either singles or doubles. And all games have four balls—singles players manipulate two balls. Doubles or singles, it's always blue and black against red and yellow. Also, players have only 45 seconds to make their shots.

Looking (at least) two wickets ahead

"We call what you've played the 'game' of croquet and we call this the 'sport,' " Rudulph (Foxy) Carter told me between shots in one of his games. Foxy, a retired diplomat, is president of the U.S. Croquet Association. He wore a straw hat and chain-smoked (croquet is a nonaerobic sport). Meanwhile, he eyed the balls rolling around the court just as a riverboat gambler figures cards. "It's all strategy—a good player is looking maybe two wickets ahead," he said. "It's a combination of chess and billiards, on the grass."

Croquet competitors range from a U.S. Olympic diver to backcountry Kentucky tobacco farmers. But the U.S. Croquet Association, headquartered in Palm Beach, Florida, recently surveyed its members and found that their average age is 43, that 25 percent are millionaires and 88 percent professionals or executives. Still, a mallet, white togs and club dues don't cost much more than weekly bowling. And sport croquet is attracting diverse players, for all sorts of reasons.

"There's something elegant about the proportions between the wickets and the balls," Brother Augustine Carter told me at Newport. "I took up croquet at St. John's College, our only intercollegiate sport—I like its beauty and refinement, and its intense intellectualism." Brother Augustine, who graduated in 1988 and is now a Benedictine monk at the Portsmouth Abbey in Rhode Island, says he's the only member of the monastery "with a croquet mallet on my poverty bill." (Monks give their abbots an annual list of their property, a "poverty bill." If it's too long, they must jettison some items.)

When I asked Carl Mabee, a dentist from Kennebunkport, Maine, what started him playing, he said: "Grass—since I was 5, with my own rake, I've always liked green grass." A few years ago he was landscaping his house, when someone suggested adding a croquet court. He drove to New Hampshire to see one, a rectangle of lush, perfectly groomed grass. "That was it,"

said Mabee. He practiced daily, even bundled on the beach on frigid January dawns before his patients arrived, and became rookie of the year. Now he is the author of a book on creating croquet courts, and two years ago he placed fifth in the national tournament.

By contrast, Bert Myer, a freelance marketing consultant from Hampstead, New Hampshire, has played since childhood. Now, he and his wife are serious croquet addicts. "Our friends rapidly became divided into two groups—those who played croquet and those, whom we didn't see often, who didn't," said Bert. In 1989 he built his backyard court, which "required four months, ten-wheeler trucks, bulldozers, front-end loaders, backhoes, tractors, transits, 15 cases of beer and soda, and two half-gallon bottles of bourbon."

Women constitute 43 percent of the U.S. Croquet Association's members, but most compete at the beginning or intermediate levels. I wondered why so few play championship croquet. I put the question to Dr. John Schott, a Boston psychiatrist, as we watched players performing their pre-hit rituals of dry swings and tiny foot shuffles. "I'd say it's the sadism—the game doesn't appeal to women as much because of the aggression," Dr. Schott said. "This game is a sublimation, which lets us express aggression in a controlled, acceptable manner."

"Just play your game—no quarter"

I was ready. I'd practiced bonking balls through wickets with a borrowed mallet, and I thought I might be a bit dangerous. Ross Robinson, who owns a travel agency in St. Catharines, Ontario, agreed to take me on between his tournament matches.

Ross, 44, a marathon runner, still plays Old Timer hockey, and rows. He was muscular and energetic. But this was *croquet.* He had been playing for only three years, he assured me. I figured I might get lucky. "Just play your game—no quarter," I said. "Sure," he said.

Ross started us off with an invocation: "May it be a titanic and close struggle, and may you end up the *Titanic.*" I got through the first wicket. But then my game hit an iceberg. Ross would make a wicket, earning one more stroke. Then, using his "play" ball, he would bonk his "partner" ball (remember—singles players manipulate two balls each) or one of my hapless balls with a "roquet" shot. That earned him two strokes, one of which he would use to send my ball off course, or if he'd hit his partner ball, to advance it toward the next wicket. With the second stroke he advanced his play ball. He would be "dead" on that ball, unable to hit it until he made his next wicket. But then the deadness would be gone. He would pass through the wicket and keep earning turns, rocketing ahead to the next wicket.

"I'm thinking about 12 moves ahead," Ross explained cheerily, while I leaned on my mallet, growing cobwebs. "Could anyone make this shot?" Ross asked.

One of my balls was blocking his next wicket. I cheered up. It looked like his run was over. Whistling, Ross took a careful swing. His ball vaulted over the obstructing ball and swished through the wicket. "Jump shot!" he cried.

As he made the wickets, Ross showed off his "pass roll"—the ball hit with the mallet rolls farther than the croqueted ball. I got to see the "peel" shot, in which you croquet your partner ball through its next wicket. He did a "split shot," the two balls shooting off at divergent angles. He did a "takeoff," barely moving the croqueted ball with the mallet, while my ball shot far down the court. Too soon, the game was over. It wasn't that I had played badly. I hadn't played at all.

Afterward, I bumped into Reid Fleming, a black-

Topflight players (below) prepare to match skills in tournament at Blantyre estate in Lenox, Massachusetts.

bearded, bearlike young machinist from Vancouver, British Columbia, who stormed the croquet world, becoming North America's top singles and doubles player four times. Now he lives in Cambridge, Massachusetts, working in a restaurant and saving his pay for trips to tournaments. He told me he started playing with friends in 1986, and by 1988 was a national singles champion. "I've got a good eye," he said. He believes the game is half coordination, half deliberation. "I like the mental aspect for sure—to really battle your wits against someone else, on a lawn," he said. "And you don't have to worry about getting too old."

Players in white lay prone on the lawns, sighting in their shots. Spectators murmured. Intermittently, a mallet bonked a ball, a classic summer sound. "Billiards on grass isn't a bad comparison," Reid said. "But it's sure a lot nicer than some old smoky poolroom."

The next generation (right) gets "death-defying" tips from U.S. Croquet Association president Foxy Carter.

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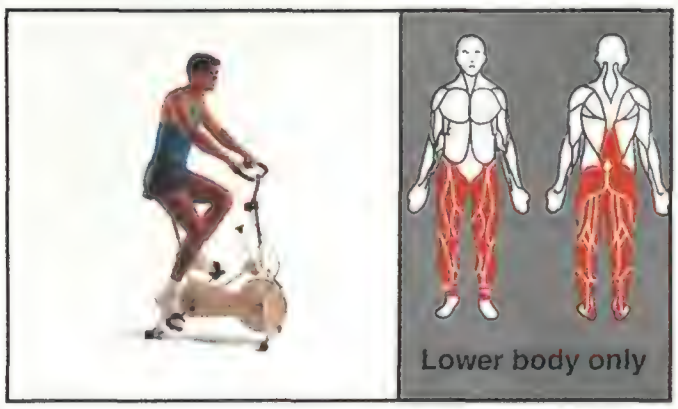

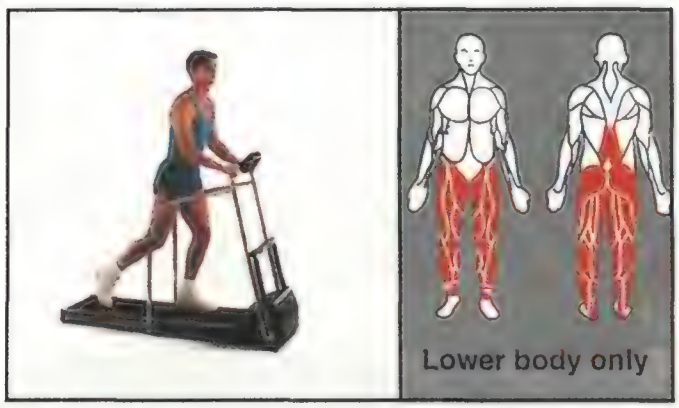

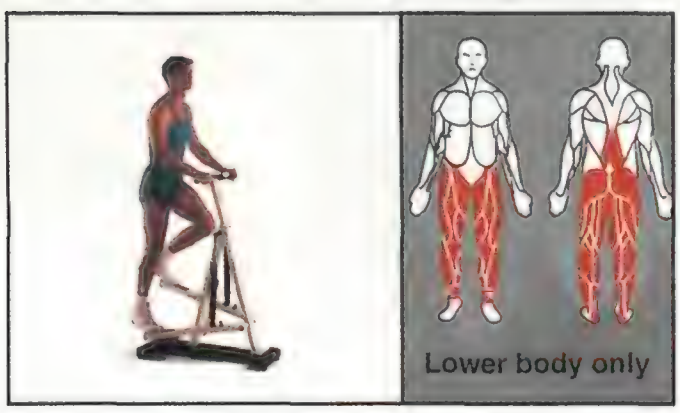

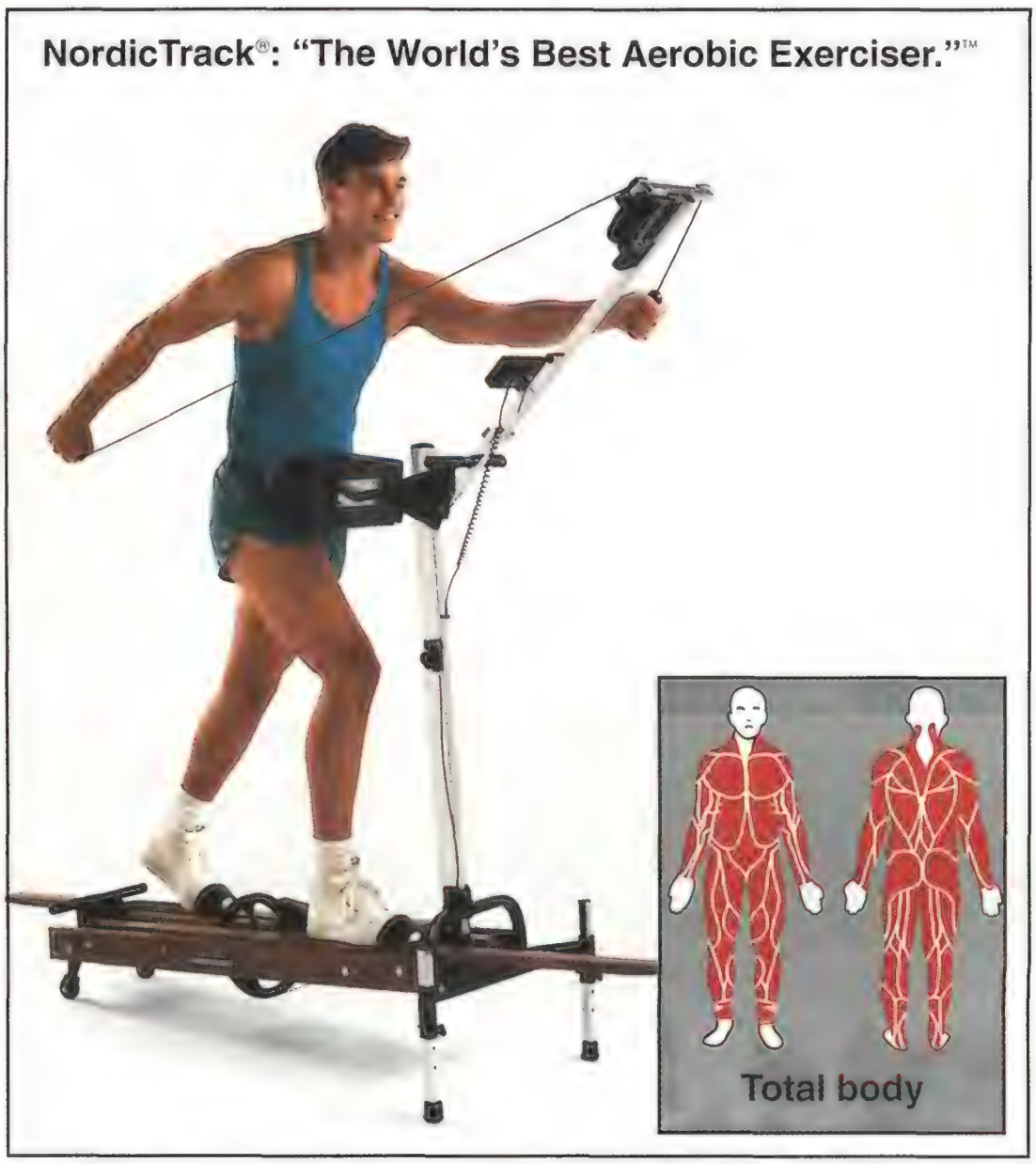

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This prince among amphibians is a Cascades frog, a species once common in Pacific Northwest mountains. Now in some lakes its young never reach adulthood, and, worse, in others it has disappeared entirely.

By Beth Livermore

Amphibian alarm: Just where have all the frogs gone?

Habitat destruction does not explain why many species are disappearing in protected areas on five continents at both high altitudes and low

Their eyes bulge, their mouths are ludicrously wide, their fat bellies glisten, their voices are a joke. To some they are synonyms for ugly, but frogs and toads are surprisingly beloved. Mark Twain gave us "The Celebrated Jumping Frog of Calaveras County," Kenneth Grahame wrote Mr. Toad a prominent role in the *The Wind in the Willows*, and for graying adults who grew up on the Smiling Pool stories of Thornton Burgess, a pond is not a pond without the *chug-a-rum* of a bullfrog. It is no accident that they figure prominently in children's stories: How many youngsters have marveled at tadpoles metamorphosing into frogs? How many little boys have come home from a day in the fields with a frog in their pocket? Countryfolk still gig frogs from boats at night, but teenage animal-rights activists increasingly refuse to dissect frogs in their high school biology classes, on the grounds that amphibians are sentient beings, too. Gardeners turn a flowerpot upside down, knock a hole in one side and set it in the dirt, hoping it will become home for a toad that will feast on herbivorous insects. Many more of us equate a frog on its lily pad with the contentment that somehow eludes us.

Now it appears frogs may be fading away, like a number of species of migratory birds. In many parts of the world, a good frog is hard to find. Ponds that once echoed to the crystal plinking of peepers in spring and the tuba riffs of bullfrogs in summer are silent. Nothing plunks into the water as an intruder moves along the shore. Even the biologists whose business it is to know where to find frogs are hard-pressed to locate any. In the past several years herpetologists, the biologists who specialize in amphibians and reptiles, have come to realize that many species are simply disappearing. And no one knows why.

Interviews with biologists on two continents brought the problem home to me. In the Pacific Northwest, I went on a collecting trip with ecologist Andrew Blaustein of Oregon State University at Corvallis. Rather, we tried to collect. Only after half a dozen stops did we finally come up with a single toad, the catch of the day, and that from a roadside puddle. For decades Corvallis scientists have ventured into the nearby Cascade Range

Photographs by Dan Lamont

Why are the frogs disappearing?

Ecologist Andrew Blaustein (second from right) and the author (right) look for frogs in Lost Lake.

to collect amphibians, and it was as easy as falling off a lily pad: frogs and toads lined the shorelines. "We'd go home with dozens after just a few hours," said Blaustein.

About five years ago, however, Blaustein and his colleagues began having to make two and three trips over Tombstone Pass to fill their needs. "Now we feel lucky to go home with anything," he said, placing the warty western toad into an empty cooler. "It's weird. There's no obvious reason for this."

Indeed. We had visited several of Blaustein's favorite hunting grounds. Nothing, other than the lack of amphibians, seemed to be wrong with them. Lost Lake, our first stop, looked healthy. Sedges feathered the shoreline. Damselflies, their wings like spun glass, danced among a dazzling array of butterflies. In the center of the lake, which dries to mud come summer, thousands of inch-long toadlets popped up and down.

According to Blaustein there should have been millions. Two years earlier, 50 percent of two million fertilized eggs never hatched. The year before, nearly 100 percent of the million eggs produced lay dead in a gooey white mat. And now only a few thousand had hatched. "We've monitored Lost Lake for 11 years," Blaustein told me. "There has never been more than 5 percent mortality."

The second site was equally idyllic and equally troubling. Lily pads and silver logs sat devoid of web-toed feet. Nothing moved. "Two years in a row Cascades frogs laid eggs here; they hatched into tadpoles, they did fine for a few weeks, and then they completely disappeared," recalled Blaustein, stirring the water idly with an empty net. The site has been studied since 1975. "Nothing like this has ever happened before." Only after half a dozen more stops did we find our toad. "That's not just inconvenient, it's scary. The massive egg mortality and the disappearance of larvae are unprecedented in Oregon." Now Blaustein looks for clues. Like hundreds of other biologists around the globe, he thinks that ailing amphibian populations may reflect the sickly state of their environments—and our world.

Blaustein is not alone. At the first World Congress of Herpetology, held in 1989 in Canterbury, England, scientists from all over the world swapped similar stories and concerns. David Bradford of the University of California said yellow-legged frogs had vanished from 37 of the 38 ponds where he had studied them ten years earlier. Michael Tyler from the University of Adelaide in Australia had not seen a gastric brooding frog, which raises its young in its stomach, since 1980. Martha Crump of the University of Florida in Gainesville said the golden toad, native to Costa Rica's Monteverde Cloud Forest Reserve, had virtually disappeared.

Alarm gave rise to an emergency workshop the following February in Irvine, California. More stories surfaced: frogs, toads and other amphibians have vanished from parts of Denmark, Nova Scotia, Peru and Panama. Places as different as the Swiss Alps and the wetlands of India are missing species. In all, 16 countries, representing five continents, reported massive

At left are Susan Walls, a postdoctoral student, and Dede Olsen, a National Forest Service biologist.

dips and die-offs among their amphibians. The implications are profound.

Amphibians are among the oldest creatures on Earth. They evolved more than 350 million years ago and shared their steamy swamps with dinosaurs. "If they disappear now, after all of that time, there's something to be concerned about," says biologist David Wake, director of the Museum of Vertebrate Zoology at the University of California at Berkeley. In addition, amphibians are a vital link in the food chain: larvae eat plants and/or animals, and predatory adults consume a wide spectrum of creatures; reptiles, birds, fish and mammals, in turn, eat them.

Moreover, it may be that amphibians signal environmental stress earlier than do most other organisms. Most have dual habitats, thereby risking exposure to both water-based and land-based contaminants and predators. They have permeable skin that interacts with water, air and dirt. They lack feathers and hair, so small increases in ultraviolet radiation may cause immediate damage. Many biologists say that amphibians are the canaries in the global coal mine.

When not furtively looking for frogs in thigh-high muck, writer Beth Livermore spends most of her time in the relatively toadless Borough of Manhattan.

Herein lies the debate. Cautious observers point out that much of the evidence is anecdotal. "That's not the kind of evidence that a quantitative ecologist would feel comfortable with," says biologist Peter Morin, of Rutgers University in New Jersey. Furthermore, critics assert that little is known about the biology and behavior of most species. So, determining whether an extinction is natural or induced by mankind is, at best, difficult. In addition, what may look like an extinction could instead be a temporary absence because of hibernation or dormancy. "You'd need about a hundred years of data to know what is 'normal,' " says Joseph H. K. Pechmann, coauthor of a 12-year study at the University of Georgia's Savannah River Ecology Laboratory in South Carolina. His investigations show wild fluctuations but overall stability.

Some species leapfrog the trend

Adding to the uncertainty, amphibians in some areas are doing quite well. Penn State biologist Blair Hedges, who has worked in the West Indies for the past ten years, reports: "Within the past two years we have heard or observed all 28 species of frog ever known to have occurred at those sites. In fact, we just added two species." The cane toad has overrun southeastern Queensland in Australia (SMITHSONIAN, October 1990). And then there are places where both vanishing and stable species live side by side. For example, thriving wood frog and declining northern leopard frog colonies reside in the same area of the Rocky Mountains.

Still, even skeptics believe that the question of decline is worth investigating. "I'm not saying that people shouldn't study the problem. I'm saying they should do it rigorously and using a protocol that you can apply from one place to the next so that you can compare results," says Morin. Others call for immediate action. "If you wait for the final word—definitive research—there may not be anything left to study," says Russell Mittermeier, president of Conservation International in Washington, D.C. "When it comes to problems of this magnitude, I'm in favor of jumping to conclusions." A number of herpetologists, a generally conservative bunch, appear to agree with him.

In December 1990 the International Union for the Conservation of Nature and Natural Resources (IUCN) assigned its Species Survival Commission to create a task force to explore the problem. "Out of this request came the Declining Amphibian Populations Task Force," says James Vial, the international coordinator. "We're applying a SWAT team approach to the problem. We want to get in there, figure out what's going on and get out as fast as possible."

E. R. Degginger/Animals Animals

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Anurans in trouble in all or part of their natural ranges (clockwise from top right): many populations of mountain yellow-legged frogs have crashed; Pine Barrens tree frogs are endangered in New Jersey; Costa Rica's golden toad has mysteriously vanished from its protected forest; northern leopard frog has taken nosedive in Colorado.

Breck P. Kent/Animals Animals

His office is located in the Environmental Protection Agency's research laboratory in Corvallis—just down the road from the Blaustein team. "But this is an international group," he says, diagraming the family tree on a chalkboard. The world will be divided into working groups. He has already assigned chiefs of staff to more than 40 groups in 30 countries. Each group will evaluate the health of local populations and probe peculiarities. He will enter the resulting information into a "Frog Log" database, which will be available to scientists worldwide.

The Australian work group sent 600,000 questionnaires to its citizenry for population data. Scientists working in Panama and Costa Rica have met to coordinate their work and to prepare a proposal for future joint studies. A team at the Smithsonian's National Museum of Natural History is developing a protocol for worldwide data collection. "It will be a complete, self-contained manual for scientists, fish-and-game people, environmental consultants—anyone interested in quantifying amphibian populations," says coauthor Roy McDiarmid. He hopes it will lead to more reliable data.

Biologists are looking for probable causes as well as measuring declines. When the European Herpetological Society (SEH) met in Budapest last fall, an IUCN committee added another 14 species to an already crowded list of threatened frogs and toads. "Habitat destruction and landscape planning are the major threats to these species," the SEH said. Most of the damage in Europe was done long ago and is not as visible today as it is in Central and South America, where daily destruction of rain forest may be wiping out frogs faster than they can be identified. But some is recent. "Before World War II, white storks sat on every rooftop in many German towns," said Ulrich Joger, an SEH officer. After the war, development swept through Germany. "Now you never see them anymore," he said wistfully. "They feed mainly on frogs."

Hans Reinhard/Bruce Coleman Inc.

Hans Reinhard/Bruce Coleman Inc

Human activities spell disaster for some species (clockwise from top left): "edible frog's" tasty gams contribute to its demise; Britain's natterjack toad has fallen victim to acid rain; habitat destruction has driven the foothill yellow-legged frog from many California streams; southern leopard frog is OK now—but in the future?

Zig Leszczynski/Animals Animals

Wardene Weisser/Bruce Coleman Inc

In some areas the German government has dug new ponds and transferred populations of frogs and toads. But it also stocks them with fish, and all too often the frogs are soon gone. French biologist Alain Dubois told me that fish planting was also common in the natural lakes of Europe. He had discovered a subspecies of newt in what was then Yugoslavia: "There were thousands of them in 1978." A few years later he sent a student to collect samples. No more newts. Instead, the student found introduced trout. In France goldfish gobble frog eggs from ponds and lakes, he said. "People bring them home from holiday and don't know what to do with them, so they dump them into the nearest pond. Zap! The frogs are gone."

Dubois is assistant director of the Musée National d'Histoire Naturelle in Paris and general secretary of the International Society for the Study and Conservation of Amphibians. I had to ask him how much the French passion for grenouille—frogs' legs—was affecting the decline of frog populations. "It may contribute to the problem," he conceded. It was in the 1950s that demand began to exceed the local supply of the species *Rana esculenta* (the common name is "edible frog," even though most frogs are edible). In the '90s the majority of frogs' legs sold in France are those of Asian bullfrogs imported from Indonesia and Bangladesh. "Today France consumes 3,000 to 4,000 [metric] tons of frogs' legs each year," said Dubois. "That's about ten times more than 20 years ago." (It takes at least 20,000 frogs to make up a metric ton.)

These days the Asian bullfrog is becoming increasingly more difficult to find. Some scientists suspect that many of the so-called Bangladesh frogs are actually being smuggled from India, where exports were banned in 1987 because insects were getting out of control. India has been forced to introduce a new frog species and increase the use of insecticides.

Dubois leaned toward me. "Do you want to discuss

Graduate student Grant Hokit grabs Cascades frog in Oregon's Scott Lake, where they can still be found. No one knows why they are gone from some lakes, not others. Mountains in back are the Three Sisters.

anything else?" he asked, a little annoyed. "There are a lot of other things to consider," he said. Indeed, predation does not explain the mysterious die-off of clutches of frog eggs in the protected Fountainbleau forest, south of Paris. In fact, the most confounding disappearances of amphibians are those occurring in preserves and parks worldwide, where hunting, fishing and farming are prohibited. Some scientists believe the most important factors in this mystery are still to be unveiled. Among the favored hypotheses: acid rain, global warming, pathogens and increased ultraviolet radiation.

To learn about the first of these, I headed to Penn State and a symposium titled "Habitat Acidity and Amphibian Decline." A joint meeting of the Society for the Study of Amphibians and Reptiles and the Herpetologists' League heard eight hours of papers that appeared to indicate that acid deposition (by rain or snow or in dry form) hurt many, but not all, amphibians. Frogs and toads are most vulnerable early in life. One study showed that their eggs, when bathed in slightly acidic water, either die or produce deformed tadpoles. Several others showed that increased acidity can slow growth rates in frogs, which means trouble for species that breed in temporary ponds and must mature before the water evaporates. Still other evidence indicated that highly acidic water kills frog sperm.

There are exceptions, however. Some Eastern amphibians, such as the New Jersey Pine Barrens frog, have long been exposed to acidic environments and show little effect. One explanation proposed at the symposium: genetic adaptation. Scientists theorize that these frogs may have evolved in their boggy, acidic habitat to avoid competition. Swedish biologist Claes Andren, of the University of Goteborg, presented evidence that a population of moor frogs exposed to high acidity for approximately 15 generations showed increased adaptation to acidic conditions. But this sort of adaptation does not help frog populations that are suddenly exposed to greater acidity.

Some scientists argued that acid rain is not a reasonable explanation for frogs' disappearance at high altitudes because precipitation is less acid there. Melting snowbanks, however, can produce a "pulse" of accumulated acidity in just a few hours. And this pulse flushes into lakes and ponds in the spring just as frogs, toads and salamanders are mating—the most crucial time in their life cycle.

The slightest warming of the globe could have a major effect on amphibians. Many scientists believe that any warming will bring changes in precipitation patterns as well. And even without global warming, of course, there are wide fluctuations in precipitation from year to year and decade to decade. Even small differences in the amount or timing can spell doom for animals that depend on water for survival and reproduction. Amphibians need a reliable water source because their permeable skins leak body fluids rapidly and need to be kept moist for proper respiration. Frogs

and toads must have water to lay and fertilize their eggs; tadpoles need water for development and growth.

An example of weather change as disaster was offered by Richard Wyman, director of the Edmund Niles Huyck Preserve and Biological Research Station in Rensselaerville, New York. In 1988 he studied breeding patterns of the yellow-spotted salamander in south-central New York. Traditionally, males journey to ponds during the first spring rain, just after the ground defrosts. Females migrate the next rainy day. That year, 23 days of dry weather followed the male pilgrimage. When the females finally made their way to the pond, most of the males had already moved on.

"Five of the 12 driest months on record and six of the ten warmest years since 1855 have occurred during the 1980s," said Wyman. Climatologists expect global warming to cause continental interiors to be drier, and droughts more intense. There is also some evidence that another predicted effect of global warming is happening now: the climatic and ecological conditions to which animals and plants have adapted may be moving northward at 300 to 600 miles per century.

The last of the golden toads?

On the telephone to Costa Rica I learned that biologist Alan Pounds, who lives and works in the Monteverde Cloud Forest Reserve, thinks a disruption of the water cycle probably played a role in the sudden disappearance of the golden toad and other species in his area. In 1988 the University of Florida's Martha Crump spotted just one golden toad. Last spring Pounds found no golden toads, no yellow-and-black harlequin frogs and just a few lime-green glass frogs. "Everything seems less abundant," he said.

Between the 1987 and 1988 breeding seasons, Pounds says, the number of golden toads and harlequin frogs observed declined by 99 percent. He notes that there is evidence that the population crashes of these two species may be linked to the unusually warm, dry conditions in 1986 and 1987. These climatic effects, combined with changes in groundwater levels caused by deforestation outside the Monteverde Reserve, may have been too great for the animals to withstand. Pounds adds that the last time harlequin frogs were censused in the 1980s, they were stressed from lack of moisture. Thus he does not rule out the idea of pathogens possibly having affected the stressed animals.

In Oregon, Andrew Blaustein had talked about the third general explanation for the apparent worldwide drop in amphibian populations: an increase in the ultraviolet (UV) radiation reaching Earth's surface. The flux has been increasing as the ozone layer 30 miles up has thinned, not only over Antarctica but, to a lesser degree, everywhere. This kind of exposure harms

In the laboratory, tadpoles are studied to see how well they do under various environmental conditions.

After two months as a tadpole, newly metamorphosed frog is about to be released into its natural habitat.

plants and animals, including humans. In Antarctica, biologists found that UV radiation damages the DNA of some phytoplankton, microscopic plants growing in the ocean. In 1975 an Oregon State University biologist had discovered that toad eggs and tadpoles (his sample had come from Lost Lake) are very sensitive to increased radiation in the middle of the ultraviolet range, commonly referred to as UV-B. (This is the same range that does the most serious damage to human skin.) Reports of frog loss seem to come more often from higher altitudes and latitudes than from lower altitudes and the tropics.

Blaustein thinks the correlation is worth investigating. So in spring of the past two years he filled a plastic jug with frog eggs from Lost Lake before the die-offs and reared them in his laboratory, away from direct sunlight. The tadpoles, raised in water from the lake, developed normally. Blaustein and his team are currently surveying 70 historically rich frog ponds to document their overall population status. He is preparing to conduct laboratory and field experiments to see how various levels of UV affect developing amphibian larvae, reproductive endocrinology and adult behavior in amphibians.

A colleague of Blaustein's, John B. Hays, has been trying to find whether frog and toad eggs can repair damage to their DNA caused by high levels of UV radiation. For nearly a year, Blaustein has delivered wild amphibians to Hays, an agricultural chemist, who removes eggs and oocytes, precursors to eggs, from them. "With those extracts we can measure two different kinds of DNA repair activity," said Hays. "The standard lab frog, *Xenopus laevis*, or African clawed frog, has a tremendous capacity to repair UV damage." If the same holds true for their wild cousins, UV may be acquitted of local egg clutch die-offs.

I left this world of test tubes and microscopes to say goodbye to the toad that Blaustein and I had caught for Hays earlier in the day. It would be killed as part of his research. Many a frog and toad have died for human benefit. Indians used the skin secretions of poison-arrow frogs to tip their darts. Frogs' legs gave us an understanding of electrical nerve impulses as well as gourmet dining. Those African clawed frogs have recently offered up clues to cystic fibrosis and Parkinson's disease. But as I walked down the hall, I found myself thinking not of their utility but of how much poorer the world would be without those unhandsome guardians of pond and garden. I made my goodbyes, shut the cooler top and headed for home.

More new Cascades froglets wait for release after having provided insights into what makes them tick. Possible causes of frog declines, such as increasing ultraviolet radiation, will not be simple to determine.

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By Paul Gardner

An extraordinary gift of art from ordinary people

A postal clerk and a librarian mined New York's lofts and galleries for 30 years—now the National Gallery reaps the reward

Herb and Dorothy Vogel filled their small Manhattan apartment with their art and a large assortment of pets.

When Herbert and Dorothy Vogel went on their honeymoon 30 years ago, they selected Washington, D.C., and not merely because of its political and historical interest. "Herb and Dorothy," as they were later to become known throughout the art world, traveled on a tight budget. He was a postal clerk in New York City; she was a librarian in Brooklyn. But Herb, who had studied art and even tried painting, wanted to show his wife that citadel of American culture—the National Gallery of Art. "Washington is a great center of art," reflects Dorothy Vogel; "we could have stayed for days." At the National Gallery they admired masterpieces by Botticelli, Van Gogh, El Greco, Renoir and Tintoretto. "It's a house of treasures, with no admission," adds Herb Vogel. "I love that museum. And now," he pauses pridefully, "we're *related* to it."

He isn't exaggerating, although back in 1962 the Vogels could not have possibly imagined an involvement or, indeed, their extraordinary contribution to contemporary American art. Neither could anyone else, for that matter. But the Vogels, a seemingly ordinary couple, made front-page news this year when they returned to Washington, D.C. once again, for the announcement that they had pledged more than 2,000 paintings, drawings and sculptures they had acquired to the National Gallery of Art. "We're receiving works that sum up two movements of the post-'60s, minimalism and conceptualism," explains Jack Cowart, the curator of 20th-century art at the NGA (this month he will become deputy director of the Corcoran Gallery of Art). "The Vogel collection enables us to focus historically on areas we haven't gone into at all."

Abstract Expressionism, as demonstrated in works by Jackson Pollock and Willem de Kooning, is boldly emotional. Pop art gained notoriety with its comment on consumerism and clichés. The Vogels immersed themselves in movements that were decidedly cool and impersonal, where the idea behind the work was more important than its visual (frequently geometric or architectural) engagement. They were irresistibly drawn to the art and the artists.

But hold on, say museumgoers hearing of the Vogels for the first time: With their modest means and lack of status, how did they know what to buy, and then how could they afford it?

Most important American collectors were born with a silver spoon in their mouth. Herb and Dorothy admit, with a burst of laughter, that their spoons were

Their art collection included some 2,000 works, the majority of them by minimalist and conceptualist artists.

plastic. The Mellons and the Fricks acquired collections through the power of their capital. Today, stockbrokers, meat-packing magnates, movie stars and oil barons appreciate the status associated with collecting. Not so the Vogels, even though they are described affectionately by friends as "mini-moguls" of art.

Quite simply, the dedicated duo used her salary to live on—and his to buy art. In this age of publicity, in which people themselves are packaged, the Vogels are genuine. They do not hobnob with collectors whose names clutter the society columns that tell us who's-still-who. They do not sit on museum boards where seats of influence are sometimes awarded to would-be benefactors. They never collected for social prestige or used art as an investment. Finally, they never had the money to seduce artists with sumptuous feasts. Besides, restaurants with foot-long menus fill them with dread. "It's just not us," says Herb.

If Dorothy's in the mood, she might offer a guest some boiled chicken, but she and Herb would rather eat in a Chinese café around the corner from their one-bedroom apartment in Manhattan. He likes the scallion pancakes; she looks forward to the fortune cookies. "An important event will soon take place in your life," Dorothy once read. She wonders now if it meant that their collection would someday belong to the nation.

"Who knows?" answers Herb, playfully. "Listen, it's better to get a good fortune cookie than a bad one." He raises his eyes toward heaven. He raises his shoulders too. "As for our collection going to the National, all I can say is wow!" Some of their art already has hung on the walls of the museum. The entire Vogel collection will be transferred during their lifetimes as part gift, part purchase. Various museums courted the Vogels, but they chose the National Gallery for sentimental reasons, such as the memory of their honeymoon, and because, continues Herb in a serious voice, "unlike other museums, it has never sold a painting."

Remaining beyond the fringe

The Vogels first began making shy appearances in New York galleries in the '60s, quietly purchasing a drawing here and a small sculpture there. No one paid any attention to them. They weren't invited to bohemian loft parties or museum sneak previews with the beautiful people of Pop. They certainly didn't have the money to buy a Jasper Johns flag or a bedroom ensemble by Claes Oldenburg. So the Vogels remained beyond the fringe of the art world, tentative and anxious, a bit frumpy, shuffling in and out of galleries, carrying shopping bags and holding hands. Unbeknownst to most artists and dealers, the Vogels were already collectors.

Herb grew up in New York (his father was a tailor) and took courses in art history and painting at New York University. At the Cedar Tavern, once an art hangout in Greenwich Village, he'd listen to the art talk, absorb it all and ask questions. After marrying Dorothy, his zeal convinced her to enroll in a drawing class he was taking. "I knew nothing about art until I met Herbie," says Dorothy, who comes from Elmira, New York (her father ran a stationery store). She looked forward to their museum outings and gallery treks. "We learned about art by studying everything that was going on. We read catalogs. We went to lectures and all the shows and, significantly, the studios of artists."

Sol LeWitt, a founding member of the minimal school, had his first show in 1965; shortly thereafter, the Vogels visited his studio and bought the piece that, they say, was their first important acquisition. It was also one of the first works LeWitt ever sold. Naturally it wasn't very expensive, admits Herb. "If you're rich,

Photographs by John Dominis

Artist Richard Tuttle has become a good friend of the Vogels' over the years; they own 350 of his works.

it's easy to start a collection. But if you need your paycheck to pay the rent and phone bill, and you want to collect, you've got to depend on instinct. What you feel in your head and heart. Wits and guts." Herb Vogel has plenty of both. "Sol was unknown then and doing work I felt was going to be important. Today it *is* important." When the Museum of Modern Art gave LeWitt a retrospective 13 years later, the Vogels were there, grinning like doting parents.

LeWitt recalls that they'd drop by his studio on Sunday afternoons. "They never wanted anything, not even a glass of water. I knew they didn't have a lot of money to spend. I also knew they cared deeply about art—not reproductions or posters but original art. They're idealistic and supportive. When you compare them to the collectors who later hit the scene—people who treat art like a commodity, who know almost nothing—you realize the Vogels are a breath of fresh air."

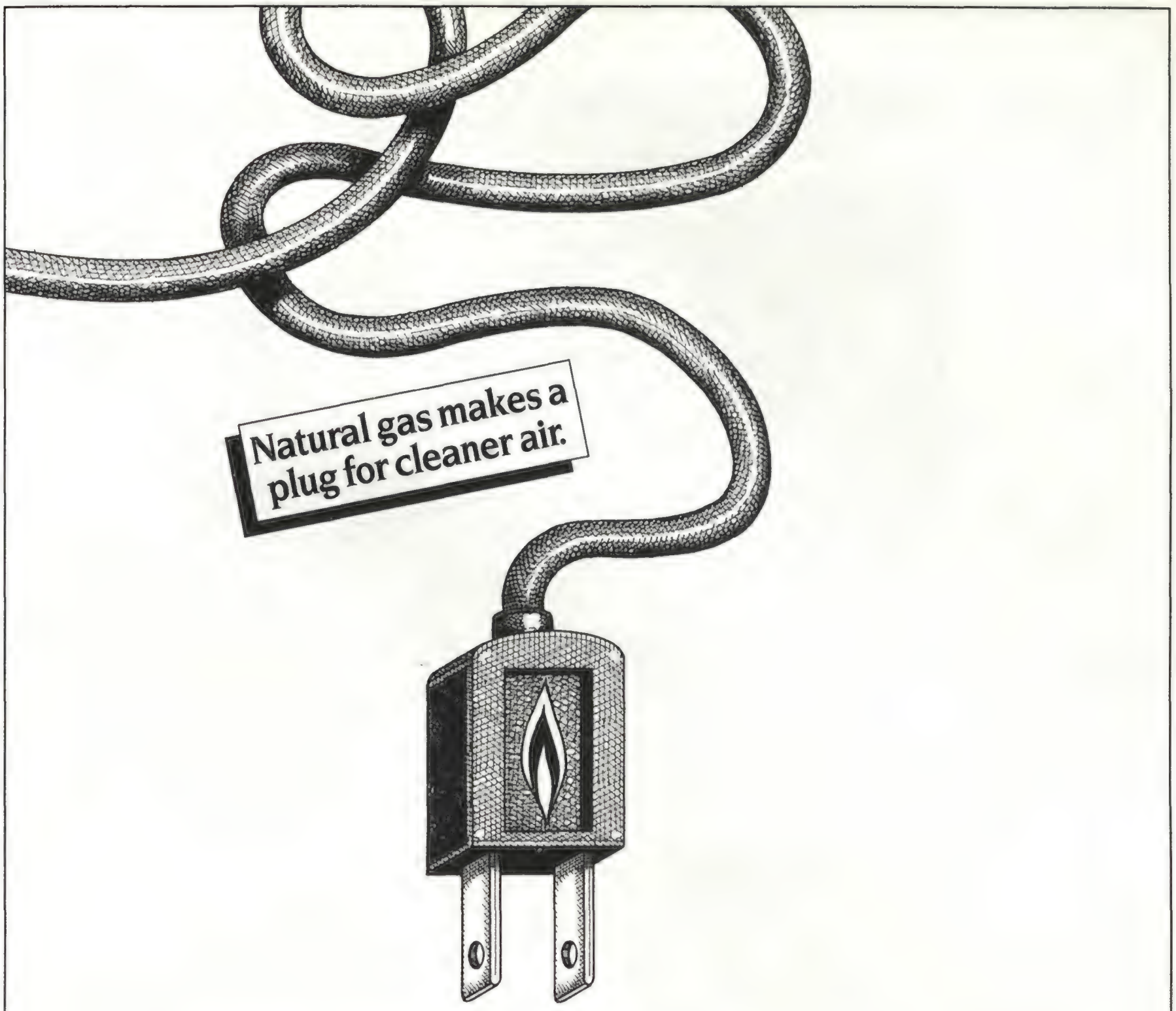
With the '70s and the emergence of minimal and conceptual art, the Vogels met other new faces of the day, such as Donald Judd, Richard Tuttle and Robert Mangold. Although they own enough LeWitts to fill a room in a museum, they also own about 350 works by Tuttle. Altogether, their acquisitions—cubes, pyramids, rectangles and other unadorned geometric shapes—seek to tease the mind or, at least, get it all bollixed up. Some critics call these boxlike ventures and floating paper pieces "blank form."

"You know if you like them"

Always direct, Herb explains: "Look, I'm not saying we understood everything we bought. If we waited for the magical light bulb to go off, we'd never buy." Dorothy, stroking a purring cat named Cézanne, adds softly, "It's about liking the art, isn't it, Herbie? When you meet someone, you may not know anything about them, but you know if you like them."

As they got to know other artists they bought more, but since they often had only a few hundred dollars to spend, their collection contains a lot of drawings. Still, artists and dealers, appreciating that the Vogels wanted original contemporary art, were generous. And why not? On a small income, the couple, with no hand-holding from an art consultant, dared to be adventurous on their own. They were further determined not to let life become a sit-at-home every night, focused on TV sitcoms. Anyway, soon there was nowhere to sit.

Over the years the walls of their living room, foyer, kitchen, bath and bedroom were massed with art. "A joke went round that I kept art in the oven," says Dorothy, laughing. "Not true. But I could have. I never use the oven." What wouldn't fit on the walls or closet doors or in cupboards, or perch on end tables—if you could find one—was packed in huge crates plunked in



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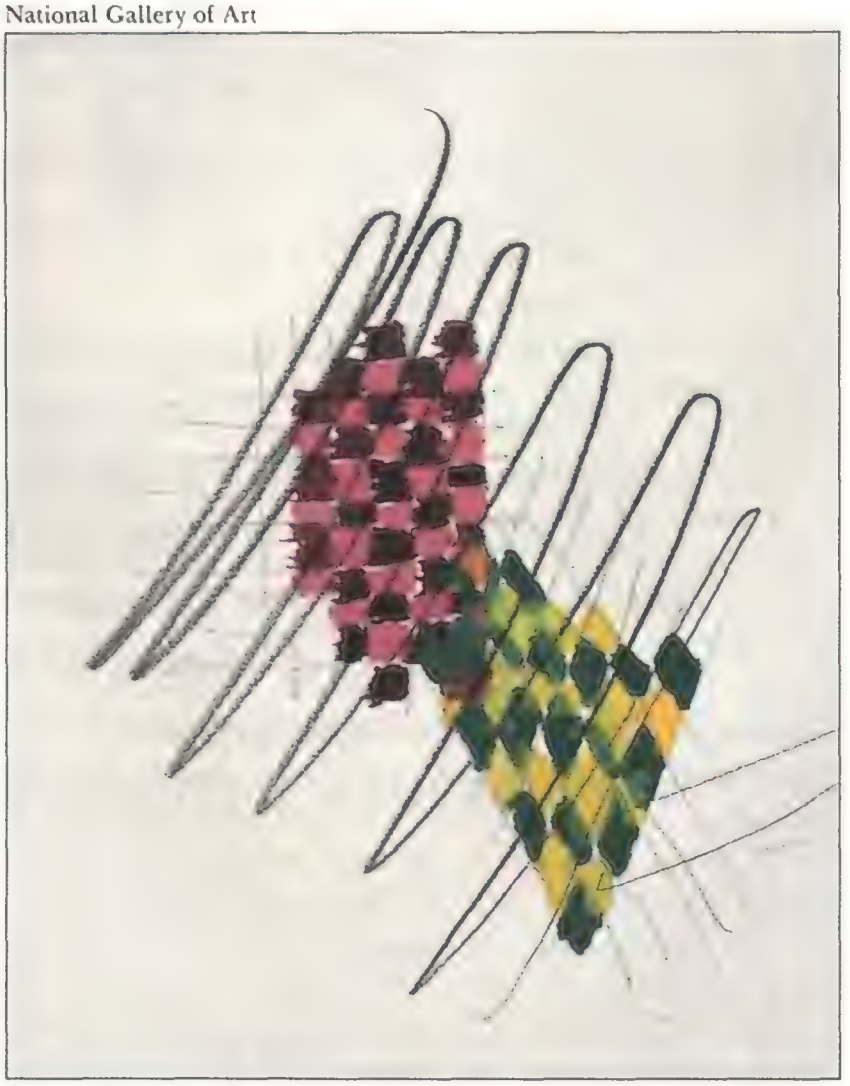
During a visit to the loft of artist Christo and his wife, Jeanne-Claude, Herb and Dorothy share a light moment. On the wall are photographs, drawings and other documentation of Christo's "umbrellas" project.

the center of the living room. Several enormous boxes added to the hazardous disorder. Turning quickly, as did one visiting journalist, you could bang your head on a steel-and-Plexiglas box sculpture by Don Judd or crush a paper construction by Richard Tuttle. What little space was left over was allocated for animals—fish, turtles and cats—rather than furniture.

"But Dorothy, with her keen librarian's mind, knew where everything was stored or shelved or hanging," says Tuttle. "I first sold them a white paper octagonal in 1971 for around $100. We found an area where I slapped it on the wall with glue and wallpaper paraphernalia. It was a radical act, in a way, but the Vogels were thrilled. I pasted it high enough so the cats couldn't reach it." Another time, Tuttle sent Herb a drawing that Herb had selected. Tuttle wrapped the purchase in another drawing—one that Tuttle had rejected, scribbling on it. But when Herb got the package, he wanted the wrapping instead (right). Tuttle is a close chum, and the Vogels have flown to Amsterdam when he exhibited new work there. "When I met them and saw their apartment, I felt, hey! their response to art is *alive*, it isn't simply intellectual, it's also spontaneous. Herb's intense opinions reflect vast knowledge. He may not be asked to join the 'art panels' in the Hamptons with collectors who own summer houses there, but he sure knows more than most of them."

National Gallery of Art



Herb's Double Reject: Tuttle scribbled on it and used it to wrap another drawing, but Herb wanted this one.

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National Gallery of Art curator Jack Cowart helps the Vogels take a rough inventory of their collection. Works lying on bed include two hanging sculptures by Steve Keister and a foam piece by John Chamberlain.

More than 200 artists are represented in their collection. Until the art began to be moved to the National Gallery, the apartment, tight and airless, a jumble of archives and art, was an "environment" unto itself, a kind of surreal fantasy created for a play by Ionesco. A crushed metal car sculpture by John Chamberlain was installed on the bed's headboard. There were wall octagonals by Richard Tuttle and a "wrapped" piece by Christo, who has gained international attention with his penchant for wrapping islands and hanging curtains across canyons. Referring to their Christo—a tarpaulin bag tied with rope—Dorothy murmurs, "There's mystery involved. Obviously it must never be unwrapped. Once you do that the piece doesn't exist!" (Herb regrets, he says, that nobody ever took a picture of the apartment when all the art was still in it.)

Herb concedes that, yes, he once unwisely hesitated about a purchase. "A valuable piece in our collection is an untitled ink on graph paper by Eva Hesse. I was aware of her for a long time. I knew she was good. But you know what? I couldn't come to a quick decision. I didn't buy until after her death. This was a mistake. We had to go to the estate, so it—cost." If it boiled down to a choice between taking a vacation or acquiring art (and that time it did), the Vogels always went for the art.

By the '80s their collection was well known and respected. So were the Vogels. Selected works from the collection were seen in more than 15 exhibitions here and abroad. Gallery gallivanting was done on Saturdays. They'd travel up and down Manhattan, from midtown to SoHo, seeing as many as 25 shows a day, and it wasn't done in a limousine. When they'd enter a crowded gallery, someone would inevitably whisper, "Look! It's the Vogels!" Small in stature, unobtrusively dressed amid mink coats and self-consciously torn dungarees, they'd be surrounded by art aficionados who now wanted to hear their opinions. They had definitely arrived. "You can say we did it by subway," suggests Herb.

When sculptor Louise Bourgeois planned a happening with famous members of the art crowd who were wearing vestments she'd designed to symbolize body parts, she wanted them to participate. Remembering other happenings where performers hadn't cared what they exposed, Herb agreed but issued a bemused proviso: "Nobody's going to ask Dorothy to take off her clothes. We'll both wear what we come in."

New York-based Paul Gardner, who writes on art and culture, is coauthor of Brooklyn: Past & Present, People & Places, *published by Harry N. Abrams.*

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Today the invitations continue to pile up. Thumbing an appointment book, a pencil jabbed in her hair, Dorothy reminds Herb that the new week includes dinner with a museum director, lunch with a magazine photographer, a benefit at the Museum of Modern Art and a meeting with a filmmaker who is planning a documentary on collectors. "Dorothy," Herb says, "we have to slow down a bit . . ."

There are also regular trips to Washington, D.C. where Jack Cowart and Ruth Fine, curator of 20th-century prints and drawings at the NGA, are still "digesting" (as Cowart puts it) the scope of the Vogel collection. "Some people have encyclopedic collections—one of everything," Cowart explains. "The Vogels collected in depth. What emerges is a personal view that gives the collection unity."

Herb Vogel, now 70, sits with Dorothy, 57, at a small desk-and-dining table, the apartment's social center, near the foyer. The collection that wouldn't stop growing, he observes, surprises even him. "As a kid growing up I learned about survival in the sweatshops. I also knew there was another world out there, and somehow I'd find it myself. So I explored the city, always on a search for knowledge. This stretched my imagination. If you build up a creative spirit within yourself, you can do without a lot of things. I spent long hours at the Museum of Natural History studying the animals—beautiful creatures. One day I wandered across Central Park and walked up the steps into the Metropolitan Museum. Here was a completely new experience! Looking at the Old Master paintings I realized how limited I was and how much more I had to know. From the Old Masters I gradually made my way into contemporary art. It carried a magical reality for me."

"We don't have children of our own," says Dorothy, opening a box of chocolate-chip cookies and spreading them on a plate. "The art that used to be here represented our children. Now it's like the children got married and moved away, but they're still ours. We can see them anytime."

Herb peers around. "When the art got moved, the apartment got painted. First time in 20 years." There are still no couches or ploppable chairs, and never will be. The living room contains scattered bookcases and cabinets, the bubbling tanks for rare turtles and fish, and a few works of art. Nibbling a cookie, Dorothy explains that she can now expand her office area; she wants to put all their books in some kind of order.

"It's true," mulls Herb, lost in thought. "The collection that went to the National Gallery is the summation of our life." He sighs contentedly.

"Now the whole country can share it," adds Dorothy.

At the Sidney Janis Gallery, Dorothy, Herb and Carroll Janis commune with figures in George Segal's "Depression Bread Line" series. The Vogels set aside Saturdays for dropping in on galleries to see art.

Good news for anyone who needs a good night's sleep.

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New SOOTHER COMPANION™ blocks out noises that can disturb your sleep with soothing, relaxing sounds of the ocean.

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"It has allowed me to sleep soundly for the first time in years."

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You'll love the new delicious sleep you're sure to get from the SOOTHER COMPANION™. It is common knowledge that the right kind of sleep can cure a wide variety of ills. Aching muscles and nervous tension seem to be at the top of everyone's list. The SOOTHER COMPANION™ may provide help for your insomnia and is certainly better for you than sleeping pills.

The SOOTHER COMPANION™ is a bargain when you think how valuable your sleep really is. Small, compact, using state of the art microchip technology to reproduce these soothing sounds. Besides on/off and separate volume controls for surf and seaside sounds, you can even set the SOOTHER COMPANION™ to come on in 60 minutes, or to play for 60 minutes. The alarm will wake you with the lovely sounds of a rooster, or sea loons or Big Ben. Digital clock with standard or military time. Connections for Audio In, Audio Out, or Companion speakers.

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1. Are you getting the correct amount of sleep?

The right amount of sleep is important. But more important is the quality of sleep you get. Consider how you feel when you wake up. If you feel refreshed, ready for an active day, then you've probably had enough sleep and the quality has been satisfactory. If not, you should consider what you can do for better sleep.

2. What is the average amount of needed sleep?

The natural range of needed sleep for adults is from five to ten hours. Most folks need about seven and one-half hours. But if you're disturbed several times throughout the night by urban noises...you're being cheated out of precious sleep time. It's no wonder so many people awaken feeling groggy, achy and irritable. People who own the SOOTHER COMPANION™ report they fall asleep faster, awaken more refreshed, and actually need less sleep.

3. Can a person sleep too much?

Some might say yes. But it could be you are not getting the right kind of sleep. Your sleep may not be deep enough. You may be disturbed several times a night and not even know it. That's why the SOOTHER COMPANION™ is so valuable.

4. Is sleep an active process?

Normal sleep patterns show almost constant change and activity. Certain research has shown that during some stages of sleep the brain emits electrical impulses faster and more intensely than during waking time. We all go through four stages of sleep within the sleep cycle. The two most important stages of sleep are Stage 1 or REM(rapid eye movement) sleep when your dreams take place, and Stage 4, or Delta sleep, the deepest stage, when your physical and mental energies are recharged. Each time you are disturbed during delta or REM sleep you lose their beneficial effects. That's why it's important that the changes in the sleep cycle happen from within the body and not from outside noises.

5. Just how important is sleep?

Very important to maintain good health. Lack of sleep or for periods as short as 60 hours can produce dangerous psychological and physical symptoms. Even a missed night of sleep has a definite effect in terms of dulled perception. Reduced reaction time. And memory impaired judgement. Not to mention increased feelings of depression. Be sure to get the right amount of quality sleep you need. Consider the SOOTHER COMPANION™ at no-risk or obligation.

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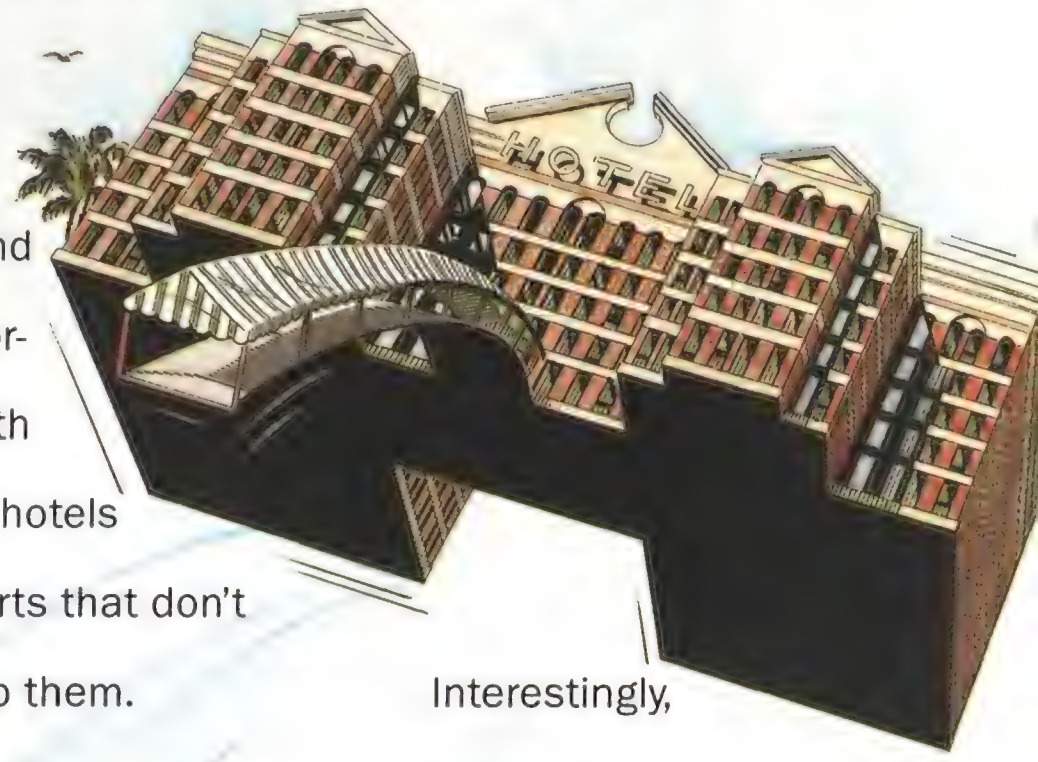

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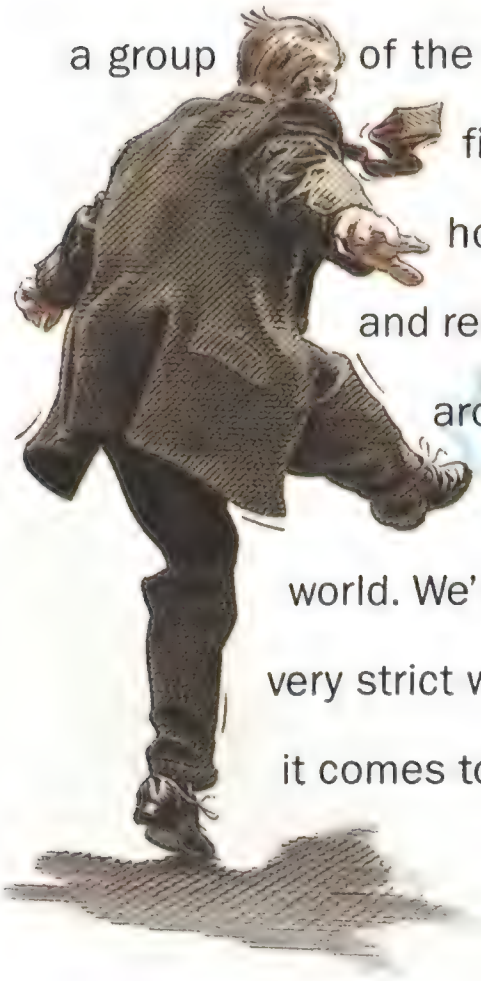

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Eleanor Roosevelt leans into Presidential handshake for FDR, whistle-stop-style, after he delivered a speech to Nebraska farmers, 1935. A shy woman who once said "I hate politics," she was a superactivist First Lady.

By Carl Sferrazza Anthony

The First Ladies: they've come a long way, Martha

The campaign roles of Presidents' wives took a quantum leap during the 200 years that separate Martha Washington and Barbara Bush

There once was a First Lady who, with her famous Yankee wit, White House dogs, charitable activities and stated removal from her husband's political decisions, proved so popular by just being herself that her spouse's campaign managers had only to evoke her name as a way of humanizing his more taciturn image.

Another President's wife, so determined that her husband be reelected, so assertive in her stance toward his leading opponent for the nomination, worked behind the scenes to combat all threats to him, lining up delegates at the torn national convention. When he lost the election, she was more crushed than he.

One First Lady, influential in personnel decisions, resolved to ferret out Cabinet members who, she felt, were not working in the President's best interests; another, who made no secret of her support of women's equality, checked out her husband's acceptance speech to the convention; yet another, who privately harbored discontent over four more years in the White House, addressed—to rousing cheers—the convention that renominated her spouse.

Barbara Bush? Rosalynn Carter? Nancy Reagan?

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Martha Washington, as hostess, helps George greet reception guests in 1789.

Betty Ford? Pat Nixon? Yes and no. She was also Grace Coolidge, Nellie Taft, Mary Lincoln, Florence Harding and Eleanor Roosevelt. The more things change . . .

If one aspect of the campaign role of a candidate's wife has remained constant in the two centuries of the Presidency, it has been her vital part in it—as public relations fixture, confidential adviser, ambitious political broker or campaign issue herself. Presidents' wives have finally come under serious consideration in a major new exhibition at the Smithsonian's National Museum of American History—"First Ladies: Political Role and Public Image." Besides their campaigning, the parts they played as hostess, patron of the arts and history, and promoter of good causes are examined, as is the way in which modern First Ladies cultivated their own public image.

The first First Lady (a title first published in 1860), Martha Washington, had no campaign to contend with, but the second, Abigail Adams, was long an adviser to her husband, John. Over their decades of public service, she wrote him hundreds of letters filled with sagacious insights. With her advice about the political climate when he ran for President in 1796 and 1800, and her intense, often

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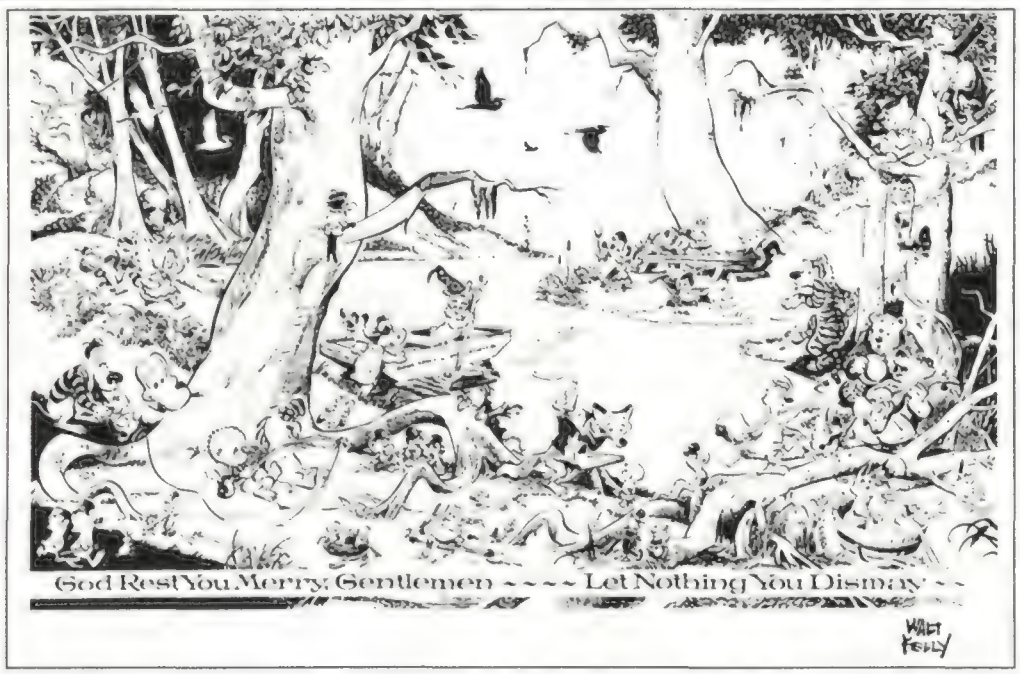

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sharp assessments of his rivals, Abigail worked as a virtual one-woman advisory committee. When he lost in 1800, she was disgusted with politics and only too happy to have him return to their Massachusetts farm.

The wife as adviser, canvasser of support and representative is a role that has evolved over the years, but few wives were ever more openly ambitious for the Presidency and willing to be a broker than the indomitable Cincinnati cyclone named Helen (Nellie) Taft. As a young woman, Nellie had gone to work because she refused to be supported by her father, and had insisted on paying half the rig rental when her beau, attorney William Howard Taft, came courting. Now she was determined to get out of Ohio and into the District of Columbia. She maneuvered her husband's aspirations away from the Supreme Court and toward the Executive Branch; Taft had become Theodore Roosevelt's Secretary of War. He and Nellie were visiting at the White House when TR joked that he saw something looming over Taft but couldn't tell if it was the Chief Justiceship or the Presidency. "Make it the Chief Justiceship," piped up Taft. "Make it the Presidency," commanded Nellie. In 1908 she stormed into campaign intrigue.

At soon-to-burn White House, Dolley Madison rescues Washington's portrait.

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Mary Lincoln, here in a rare family picture, was bashed by foes and press.

Roosevelt locked horns with Nellie the broker as the election neared. Surprisingly, she was granted a meeting with him to discuss party politics. She wanted TR to come out in support of Taft, but TR felt Taft wasn't being aggressive enough for the nomination. Angrily, Nellie penned her husband that Roosevelt "seems to think that I am consumed with an inordinate ambition to be President . . . I felt like saying, 'D--- you, support whom you want, for all I care.' But, suffice it to say, I did not."

During the convention Nellie waited in Taft's office for reports via special telephone hookup. On the day he was nominated, she was the first person to congratulate him. She often appeared with her husband, scrutinizing him, listening carefully to his text and gauging public reaction. She feared any thorns that might keep her from plucking the Presidential rose. Once, while traveling, she and Taft were playing bridge when she suddenly

Carl S. Anthony wrote the two-volume history First Ladies: The Saga of the Presidents' Wives and Their Power, 1789-1990 *(Morrow), and he was consultant for the NMAH exhibition.*

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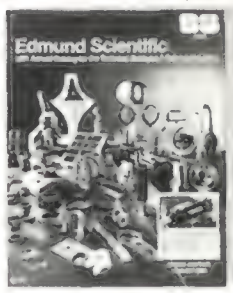

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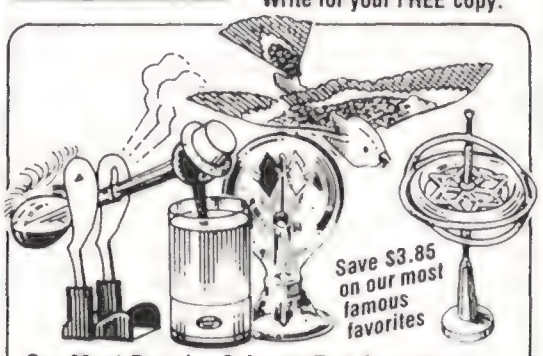

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realized it was Sunday and panicked about press reprisal, imagining the headline "TAFT PLAYS CARDS ON SABBATH DAY." The stress began to bear down upon her, and there was something ominous in her admission, "The ups and downs of such a campaign, the prophecies, the hopes, the fears aroused by favorable and opposing newspapers were all new and trying to me, and in a way I think I was under as great a nervous strain as my husband was." Only about eight weeks after becoming First Lady, Nellie Taft suffered a stroke and lost the power of speech.

But the unsinkable Nellie had learned to speak again before the next election, and started making public appearances as the campaign warmed up. She foresaw the inevitable, which came when Theodore Roosevelt, having been President from 1901 to 1909, challenged Taft for the 1912 Presidential nomination. "Well," she told her husband, "I suppose you will have to fight Mr. Roosevelt. . . . I told you so four years ago and you would not believe me." Taft snapped back, "I know you did, my dear. . . . You would have preferred [TR] to come out against me than to have been wrong yourself."

But if Nellie was giving Taft hell,

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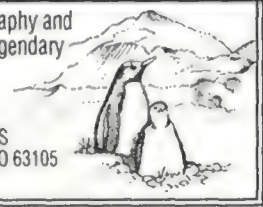

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Edith Roosevelt rejoiced in TR's loss of the 1912 nomination to W. H. Taft.

Edith Roosevelt was blasting her husband, too: "You can put it out of your mind, Theodore, you will never be President of the United States again." Edith nonetheless attended the split convention and even edited TR's speech. When he lost the nomination, she said, "Oh, I'm so glad my husband escaped; you cannot know how happy I am that the White House is not ahead of us." (TR then ran for the White House as the Bull Moose candidate, only to lose again, along with Taft, in a three-way race with the Democratic contender, Woodrow Wilson.)

As the role of women in American society has changed, so too has the perception of the First Lady, long upheld as an example of that society. As Edith Mayo, curator of the NMAH exhibit, explains: "Each generation asks new questions—what the First Lady does and could do, and what she represents and could represent. In seeing the functions of this 'office' as it developed, the hostess and ceremonial roles seemed clear enough, but when we are talking about Presidents' wives, we're always talking about political implication. So we wanted to look at her as a political figure.

"The First Lady has always walked a tightrope—how much of her life should be public, how much private.

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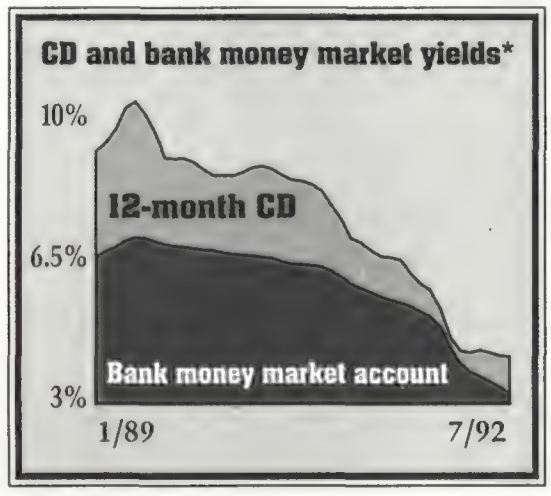

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This is particularly well illustrated in the exhibit by showing these women 'running for office' themselves. How did they choose to present themselves and to reflect their husbands? What did the public see of them? How involved were they?"

Early on, Dolley Madison was one wife who obviously relished the political machinations. In 1812, James Madison was running for reelection. "All are busy electioneering," Dolley wrote her sister, soliciting inside information from her about New England. "I do not admire the contentions of parties, political or civil, tho' on my own quiet retreat I am anxious to know all the maneuverings of both, the one and the other, so be not timid." One Senator said that Dolley had been "a very good President, and must not be turned out."

Actually, Dolley was a very good "Presidentress," as some called her. As war clouds gathered and conflict with England seemed inevitable, she began her strategy to get her husband reelected by cultivating friendships with leaders of the so-called War Hawks. "The intrigues for President . . . go on," she wrote, "but I think they may terminate as they last did." And indeed they did. As Dolley planned, Madison gave in to the Hawks' de-

Nellie Taft was the first wife to share spouse's Inaugural ride to White House.

mand for war, and they, in turn, supported him in his campaign for reelection a few months later. One statesman would write, "Mrs. Madison saved the administration of her husband. . . . But for her, De Witt Clinton would have been chosen President in 1812."

Also no slouch as a promoter was Louisa Adams, who turned to individual members of Congress to help elect her husband, John Quincy Adams, in 1824—the last time Congress would nominate the Presidential candidates. Armed with her calling cards, prepared by him with "as much formality as if he was drawing up some very important article to negotiate in a Commercial Treaty," she used her social skills to curry favor, always "Smilin' for the Presidency," as she put it. In 1824 alone, Louisa had 68 Congressmen to dinner. She even electioneered outside of town. She urged John Quincy to take a modern approach

During their "front porch" campaign of 1920, Florence Harding helped select the groups that visited Warren at the couple's Ohio home.

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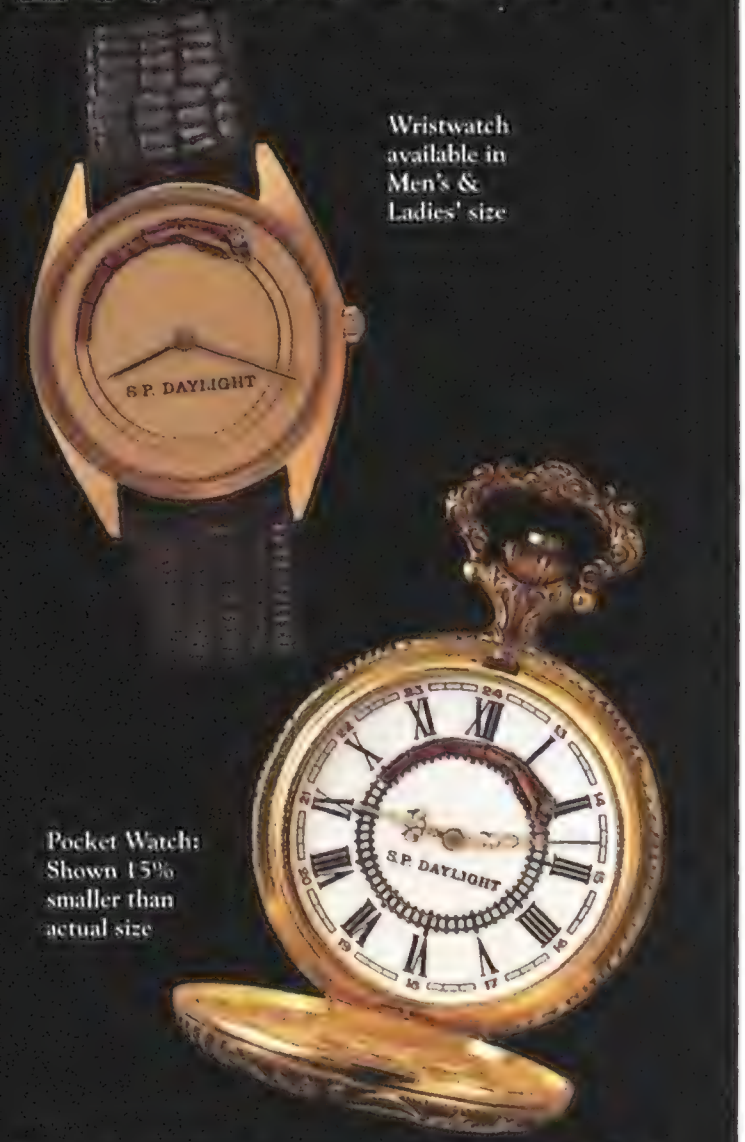

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and get out of Washington to "show yourself if only for a week. . . . I implore you and if harm comes of it I promise never to advise you again." Terming it "my campaign," she wrote of a trip to Maryland where she talked him up. Adams ignored her advice but did become President. When he ran again in 1828 she mapped out a route for him from Boston to Washington. But he refused to campaign publicly, Louisa chastising that his decision "embarrasses me very much." This time he lost.

Personal ambition—or lack thereof—proved to be the greatest motivator of a wife's involvement. Some mid-19th-century wives openly resented the intrusions of public life on private life. After William Henry Harrison's 1840 election, Anna Harrison's only comment was, "I wish my husband's friends had left him where he is, happy and contented in retirement." In 1852 Jane Pierce learned that her husband, Franklin, had been nominated for the Presidency—and fainted. Margaret Taylor predicted that the 1848 nomination of her Zachary was "a plot to . . . shorten his life by unnecessary care and responsibility." She prayed that Henry Clay would win. Her prayers went unanswered, but her lugubrious prediction came true: Zachary died after only 16 months in office.

But, like Dolley Madison and Louisa Adams, other wives were eager for the

Grace Coolidge (left), who once taught the deaf, converses with Helen Keller.

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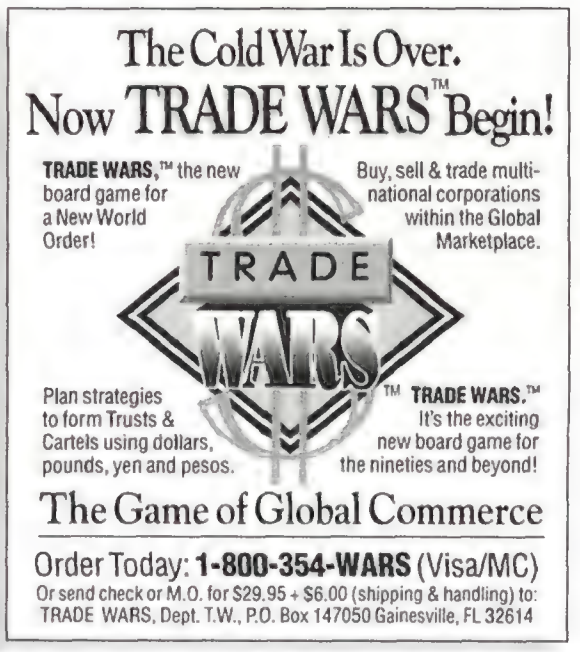
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And no 19th-century wife was more ambitious than Mary Lincoln. In Kentucky, she had developed a love of politics through her father's chum Henry Clay. In 1840 she wrote a friend, "This fall I became quite a politician, rather an unladylike profession. . . ." She dated one lawyer, Stephen Douglas, but wed another, Abraham Lincoln. Ironically, Douglas would be Lincoln's opponent for the Presidency in 1860. Mary declared, "I would rather marry a good man—a man of mind—with a hope and bright prospects ahead for position—fame and power than to marry all the houses [of] gold . . . in the world."

Lou Hoover checks Girl Scouts' cookery skills. Scout membership soared under her leadership; she approved of "marriage and a career."

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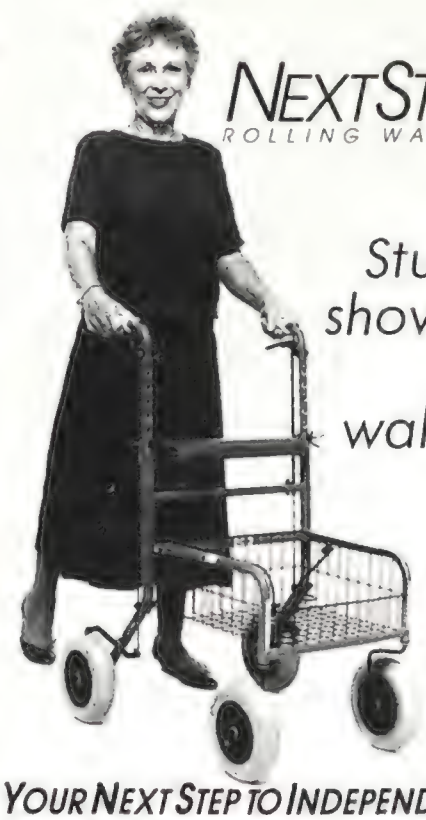
Campaigning, she believed that giving a "brave, whole-hearted fight" made "one feel better." To her home she welcomed journalists, one of whom wrote that Mary was "quite confident of her husband's election." That was an understatement. Mary was obsessed with winning: "I scarcely know how I would bear up, under defeat. I trust that I will not have that trial." When Lincoln learned of victory, he shouted to his wife, "We are elected!"

By the early 20th century, the extent of a wife's involvement in the political process was still kept secret, although the taboo of using her picture for publicity had been broken. Edith Roosevelt was so removed from the scene during TR's 1904 campaign that she listened behind screen doors to hear him receive the nomination notification at their home. Her stepdaughter, the acerbic Alice, recalled their being "hidden out of sight, like houris in the harem, while the men per-

In 1940 Eleanor Roosevelt gives first First Lady's speech to a convention.



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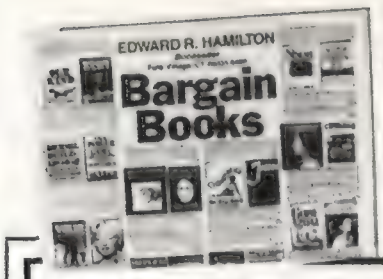
Bess Truman, who hated the spotlight, joins Harry in a whistle-stop goodbye.

formed their stately minuet outside."

Women first voted in a Presidential election in 1920 and, as their movement gained momentum, the political activity of candidates' wives increased. Warren Harding's wife, Florence, was unlike any of her predecessors. Without the traditional role of mother to play, and with unusually acute financial acumen, she had spent years as business manager of her husband's newspaper. In every professional way, Florence was the ambitious partner of Warren. In 1920 she became the first candidate's wife to boldly admit, "Yes, I'm a suffragist!" When things looked bad for Harding during the Indiana primary, she grabbed the phone from him as he was about to tell his manager he was pulling out of the race and yelled that he was in it "until hell freezes over!" During the Chicago convention that nominated Warren, she followed the voting trends through each ballot and talked to reporters about them. When Harding was delivering his acceptance speech and mentioned the women who would be voting for President for the first time, a journalist leaned over and asked Florence, "A mark, no doubt, of your influence, Mrs. Harding?" She smiled and nodded.



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Curiously, the wives of the next two Presidents seemed to regress, soft-pedaling any political role they might have, most likely out of fear of appearing to domineer—after some very powerful First Ladies—and thus becoming a campaign liability. Personality was also a factor. Some "traditional" women resisted having any information about their influence disseminated. Even though they were involved, they cultivated a public image emphasizing the opposite.

At the 1944 convention that nominated President Franklin Roosevelt for a fourth term, one politician's wife was uniquely unhappy: the woman whose husband had accepted the Vice Presidential bid. She was opposed to the idea. Called a "shrewd politician" by one party leader, she understood tax bills, served as an anonymous source for friendly reporters and managed her husband's Senate office when he was away. As her spouse, Harry Truman, admitted, "I never make a speech . . . and . . . decision unless she is in on it," calling his wife, Bess, "the Boss." With prescient concern, she fumed at him for accepting FDR's offer. "What would happen if he should die?" she badgered. "You'd be Presi-

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In 1953 Mamie Eisenhower has her only press conference; she avoided politics.

dent." Only nine months later, Franklin Roosevelt was dead, and Harry Truman was President.

Bess Truman was stone-silent about the importance of her role in her husband's 1948 Presidential campaign. Quite telling, however, after yet another introduction by him of "And here comes the Boss," was her crack, "You better believe that one!" Behind the scenes, Bess was part of a small circle of advisers, reviewing the speaking schedule, evaluating Harry's appearances, monitoring his health and diet, and even—spied in a train window by one reporter—blue-penciling one of his speeches. Her veto power was substantial. When she learned that a governor who had once criticized Truman was about to board their train when it stopped in his state, Bess refused to let him get on.

Jackie Kennedy wears one of her legendary pillbox hats as she campaigns in Manhattan with JFK, 1960. Her glamour and popularity were big political assets.

In the mid-20th century, as long as a wife's advice remained secret, it seemed permissible. In 1952, Mamie Eisenhower's press focused on her bangs, hats, love of family and utter devotion to her husband, Ike. Her credo was: "Ike runs the country, I turn the pork chops." Privately, Mamie had definite ideas on how Dwight Eisenhower should present himself to the public and the press. Once when he was rehearsing a speech, Mamie interrupted: "Ike, you can't say that. It's

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not in character." Angrily, he continued. Again she stopped him: "Ike, that simply isn't you." For the next 20 minutes Mamie kept making suggestions. At long last, according to aide Kevin McCann, Ike threw down his speech. He never delivered it.

How "unpolitical" a political wife should be became a particular problem for the most openly active First Lady, Eleanor Roosevelt, who was acutely uncomfortable walking the tightrope. Nevertheless, for the 12 years of FDR's Presidency, she delivered speeches, met with policy advisers and offered controversial opinions on a wide variety of subjects.

For Eleanor, campaigning threatened to compromise her professional pursuits as a teacher and journalist, and the independent life she had so painfully carved out for herself. Her most direct public impact on the 1932 campaign was conducted offstage as she helped write and publish the highly successful "Rainbow Fliers," campaign literature aimed at women and printed on pastel paper.

No wife ever endured more national campaigns than Eleanor Roosevelt did, yet each stirred anxiety in her. "Overwhelmed at the mere possibility" of becoming First Lady, she said that, on election night of 1932, the "turmoil in my heart and mind was rather great." Although her political work as First Lady instilled confidence in her, Eleanor retained the rigid traditionalism that was associated with campaigning. At the 1936 convention, the first woman Cabinet member, Secretary of Labor Frances Perkins, pointed out the irony of Eleanor's absence: "There is a woman Democrat who is not at this political convention because she is detained by social conventions."

As Eleanor told reporter Bess Furman, the ideal candidate's wife should limit appearances but be on time, offer no personal opinions, remain undisturbed by commotion and lean back in an open car so the voters could always see *him*.

But when FDR shattered precedent by running for a third term, Eleanor followed suit and broke her own rules. Delegates at the 1940 convention were stonewalling FDR's choice of Henry Wallace as running mate. FDR knew that they needed to be unified. He sent Eleanor. To the rapt audience she explained: "You cannot treat it as you would an ordinary nomination in an ordinary time. . . . rise above . . . partisan[ship]." Because war was escalating in Europe, she added, "This is a time when it is the United States we fight for." One newspaper headlined: "MRS. ROOSEVELT STILLS THE TUMULT OF 50,000." It was the first time a candidate's wife addressed the national convention that would nominate her spouse.

The reluctance of the campaign wife to become too public is based on a fear that she herself might become an issue. This was a worry for Mary Lincoln in 1864. Her compulsive shop-

Lady Bird Johnson, during her husband Lyndon's 1964 campaign, starts a solo whistle-stop tour—the first of its kind; he joins her well-wishers.

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ping sprees had put her $27,000 in debt. "If he is reelected," she confided to a friend, "I can keep him in ignorance of my affairs; but if he is defeated, then the bills will be sent in, and he will know all."

Although her personal money problems did not leak, her official profligacy—redecorating the White House, purchasing new White House china—as well as the fact that several members of her family were soldiering for the Confederacy, and the misperception that she was grossly insensitive to the war suffering, all threatened to work against the campaign. Mary feared most what a Cabinet member called "a secret pamphlet . . . levelled agst. Mrs. L." One Democrat admitted, "I have been writing out all the bad things I have heard of Lincoln and his wife, hoping to get them into the papers." A White House staffer recorded, "Rumors are about, that the Democrats are getting up something in which they intend to show up Madam Lincoln." Although the press continued to criticize her, Mary did not become an issue.

When the charges against a candidate's wife were completely unfounded, however, she could take things into her own hands, thank you. During the 1888 campaign, two years after beautiful, 21-year-old Frances Folsom had married her guardian, President Grover Cleveland, her public popularity was not lost on those who opposed his reelection. A rumor spread that he regularly beat her, and it soon appeared in an anonymous pamphlet at the convention. Frances broke precedent by writing an open letter to the press denying the story. She was righteously defended at the podium—thought to be the first time that the name of a candidate's wife was invoked at a convention—to "such rounds of applause that men lost their heads."

Mamie Eisenhower reacted similarly when a scandal claiming that she was an alcoholic turned up in some crude "smear brochures." Although she did not personally take on the

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story (Ike, however, denied it), a party official recalled that when Mamie was later photographed drinking a glass of water, she called out that she wanted the film destroyed. It was.

The physical image and visibility of a candidate's wife increasingly became potential assets. Mary Lincoln attended rallies where Abe was speaking and was at his side during an Ohio campaign trip. Never before had a wife done so, but it was more a matter of her wanting to be there than a means of attracting votes. In 1880, politically savvy Lucretia Garfield told her husband, James, "I do not want you to have the nomination merely because no one else can get it, I want you to have it when the whole country calls for you." Her ambition, however, did not include personal public display. She allowed only one formal photograph of herself to be used in the campaign. But Lucretia became—without her permission—the first candidate's wife to appear on an official campaign poster.

The age of campaign paraphernа-

Betty Ford (with Judith Jamison, 1976) championed women in Gerald's term.

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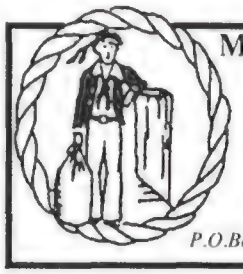

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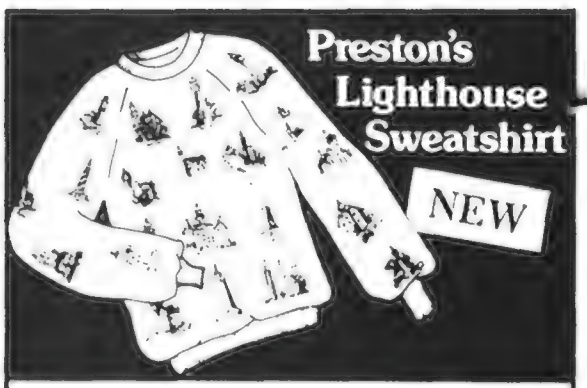

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lia blossomed with a multitude of manufactured geegaws, and the image of the virtuous wife at the hearth was a good way to sell the family man. Even though Grover Cleveland adamantly opposed the use of his wife's comely face "to exert political influence," some of his supporters produced posters, plates, cards and other items with Frances' likeness. The attitude toward a wife's image turned with the century. During William McKinley's 1896 campaign, a picture of his wife, Ida, appeared on ribboned badges and stereopticon cards—and hers was the first campaign biography of a wife.

Public appearances by a wife at political events, as well as her special appeal to women, the new voting populace, culminated in the complex personality of Florence Harding in the 1920 campaign. It was, in many ways, the watershed for political wives going public. If Florence's partnership with Warren didn't stop when he ran for President, neither did her honesty in expressing herself. She openly answered questions from journalists and permitted direct quotes to be printed. The *New York Times* praised her as the only candidate's wife "who came more than halfway to meet newspaper reporters."

The stage was now set for wives to openly serve the public relations aims of political advertising. First Lady Grace Coolidge was frequently pictured and mentioned in the press with her famous collie dogs, Rob Roy and Prudence Prim. Known for her sense of humor and warmth, she made no apologies for her lack of involvement in the policies of her husband, Calvin (nicknamed "Silent Cal"). She not only offset his dry public persona but was called "ninety percent of the Administration." Consequently, her bipartisan letter to a Republican women's group endorsing the involvement of women in the political process was published in the newspapers.

Grace posed for a publicity picture on the White House lawn, sitting at

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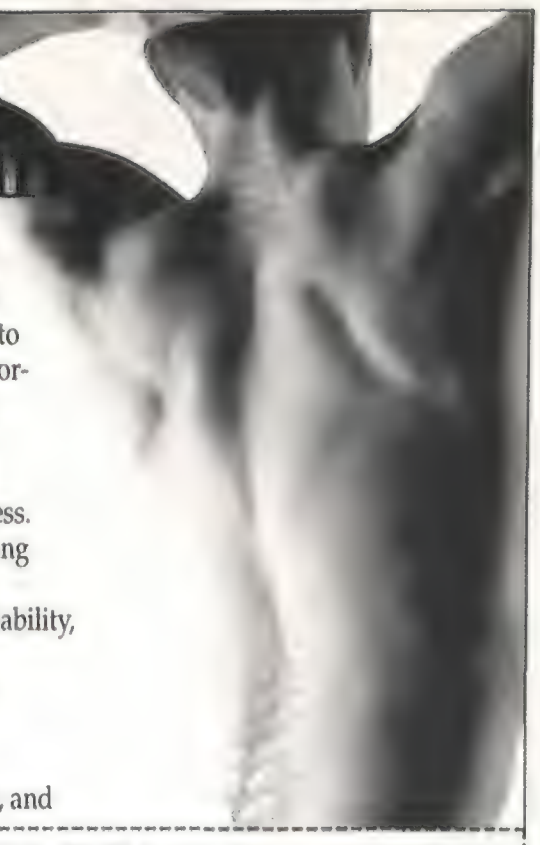

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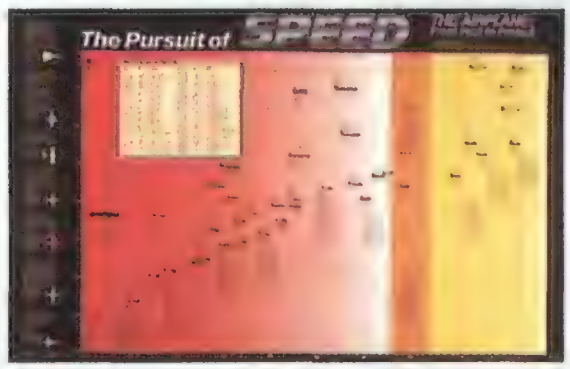

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Rosalynn and Jimmy Carter in 1976; a political partner, she sat with Cabinet.

her desk (brought out for the occasion) and filling in her absentee ballot. Press releases emphasized her "fine biscuits" recipe and her ability to sew shirtwaist dresses for $1.69. A minor backlash ensued when a Democratic committeewoman dismissed the use of the First Lady as "milkpail stuff" and questioned the propriety of using a wife as an "advertisement." A wag wondered "if the poor girl was ever out of a bungalow apron."

But the appropriateness of a wife speaking to the crowds was something else again, even for as eloquent an orator as Lou Hoover, who had been making substantive speeches for a decade to groups like the Pan-American International Women's Conference and the League of Women Voters. When Herbert Hoover ran for President in 1928, Lou stopped talking. "I enjoy campaigning," she told reporters in her only recorded public comment during the campaign, "because my husband makes the speeches and I receive the roses."

And in light of Eleanor Roosevelt's future activities it was ironic that, as wife of the Democratic Vice Presidential candidate in 1920, she was re-

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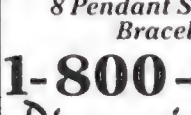

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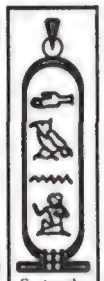

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pulsed by the idea of wives promoting their husbands in campaigns. "I hate politics!" she wrote Franklin at the time. It was only after being coaxed that she began making appearances on the train platform (reporters were told to make funny faces to prompt her broad grin). But, Eleanor confidently admitted, when FDR's speeches became too long-winded she would "yank at his coat-tails."

The practice of wives sharing whistle stops seems to have evolved almost unconsciously until, in 1948, the spouses were officially integrated into the act. Yet Bess Truman refused to acknowledge her role as being anything but a proper prop: "A woman's place in public is to sit beside her husband, be silent and be sure her hat is on straight."

In the post-World War II era, when women were largely expected to put down their welding torches, pack away their Rosie the Riveter coveralls and pick up where they had left off in the kitchen, candidates' wives reflected the "return to home," as Edith Mayo puts it. What had changed, though, was that now a political wife could appear everywhere with her campaigning husband and even on her own—just so long as she remained supportive and never, never discussed substantive issues in public.

In her era, Mamie Eisenhower was perhaps the best campaign wife, not because of anything she said but because of how she looked and how she responded to people. She was more chatty than Bess Truman but far less imposing than Eleanor Roosevelt. Journalist James Reston wrote of the 1952 campaign: Mamie is worth "50 electoral votes." Campaign songs celebrated her, and the official Republican "wife" button read "We Want Mamie." Said Ike, "She is a better campaigner than I am."

Although no studies were conducted about the actual impact of a wife on a campaign, by 1960 both parties had decided not only to play it safe but to play *her* up. Certainly the popularity

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of Mamie hadn't hurt the popularity of Ike's two Administrations. And television—first used for nationwide campaigning in 1952—perfectly converged with her increased visibility. Luckily the candidates, Richard Nixon and John Kennedy, had extremely telegenic wives, however uneasy each woman was with the idea of appearing and speaking on TV. This campaign also saw the start, by the press, of a "race for the First Ladyship," using the traditional context of fashion and hairstyle to pit Pat Nixon against Jackie Kennedy (a precursor of this year's press-generated Barbara Bush-Hillary Clinton cookie bake-off), and illustrating how important a wife's style had become in conveying a candidate's own image to the public.

Campaigning solo was a precedent embellished in 1964 by incumbent President Lyndon Johnson's wife, who whistle-stopped aboard her "Lady Bird Special" in the Southern states and was met by hostile protesters who objected to her husband's civil rights policies. After the election, Lady Bird also raised other issues, such as highway beautification (one of her own pet projects), without provocation by either the public or the press.

The campaign "team" was alive and well—as it is today. The whistle stop had become obsolete by 1968 (although destined for reincarnation as a bus tour in 1992), and wives were covering thousands of miles and several regions in one day by air. The many roles of the campaign wife seemed to meld in First Ladies like Betty Ford, Rosalynn Carter and Nancy Reagan.

The big question: Are the political abuse, gossip, invasion of privacy, tired feet, sore throats, crushed hands and rubber-chicken dinners worth it? After all, *he* is still the one elected. Yet, when more professional women than ever find themselves cast as the supportive wife, they still seem willing to sacrifice, smile and sit silently (despite current signs that the "silence" factor may be on its way out). What's in it for them?

Perhaps there is a clue in the very first remarks made by Ulysses S. Grant after his Inaugural Address at the Capitol. As his admiring public stood before him, he turned toward his wife, Julia. "And now, my dear," Grant sighed to the proud new First Lady as he shook her hand, "I hope you're satisfied."

Nancy Reagan, Barbara Bush, Pat Nixon and Betty Ford met in 1990 at the opening of the Nixon Library in California; as a group they personify the diverse roles that First Ladies, though unelected, have played.

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584 United States Virgin Islands. *"Follow a Rainbow"* – An entirely new concept in travel films, with the cultural aspects of a destination counterpointing the sun, sand, and sea of a Caribbean vacation.

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546 The Cloister Sea Island. *Georgia* – An "understated elegance" best describes this 5-Star island resort. Explore what has made this hotel a favorite destination for honeymooners, families, even Presidents.

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658 Ottawa Tourism And Convention Authority. Canada's capital city of Ottawa provides a wide variety of exciting festivals and attractions and is a year round drawing card for visitors of all ages.

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628 Special Expeditions. *"Among the Great Whales: Voyage to Baja and the Sea of Cortez"* – Discover wildlife-rich islands and waters, where gray whales migrate each winter, aboard the expedition ships Sea Bird and Sea Lion.

636 Virginia Tourism Board. *"Discover Virginia"* – The year-round fun of Virginia's beaches, mountains, theme parks and history are highlighted in this fast-paced video.

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653 Abercrombie & Kent. *"Luxury Barging"* – A&K takes you on an elegant journey through the waterways of France, Holland and England, where days are spent exploring the countryside or peacefully watching it pass.

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607 Austrian National Tourist Office. This lively video presents the cities of Vienna and Salzberg and much of the countryside in between, with a focus on practical advice and money-saving travel tips.

608 Belgian Tourist Office. Come and enjoy Belgium and it's Europe. Experience the fine cuisine and don't forget to bring back our famous chocolates.

609 Berlin Tourist Office. Germany's capital, is the magical European city that stole the world's heart when the Berlin Wall fell in 1989. United again, Berlin is captured on film by an American film crew.

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612 Lufthansa German Airlines. *"Germany for all Seasons"* – An award-winning video travelogue of Germany – the first since German Reunification – highlights traditional German charms: Berlin, Bavaria, Heidelberg, the Rhine and introduces eastern Germany.

613 New Zealand Tourism Board. Described as a world in miniature, New Zealand offers a myriad of sights and adventures... trekking among magical rainforests, sailing around sub-tropical islands.

597 RailEurope. *"Europe By Train"* – This video guide teaches the ins and outs of traveling the 100,000 mile European rail system, detailing types of trains, accommodations, and the various rail passes used to simplify travel and save you money.

598 Rockresorts. *"The Spirit of Rockresorts,"* a classic selection of unique resort experiences in the Caribbean, English Countryside, and Hawaii. Each resort is different. Only their commitment to excellence is alike.

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651 Swiss National Tourist Office. *Brienz* – Traditional Switzerland at its best. Spectacular scenery, friendly people, myriad recreational and cultural choices.

617 TAP Air Portugal. *"An Invitation to Portugal"* – Discover the new world... Portugal. Fly in luxury and comfort to this land of inspiration.

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647 Holland America Line. *"Panama Canal A Voyage Through History"* – Meet the engineers who conquered obstacles to construct the "Eighth Wonder of the World," and explore exotic ports along the way.

527 KD River Cruises Of Europe. The experience of cruising the Rhine, where KD, the oldest passenger line in Europe, has been operating for more than 165 years

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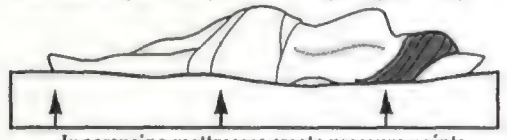
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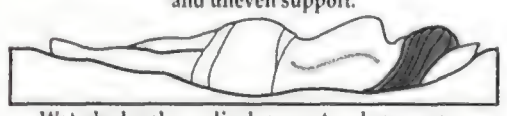
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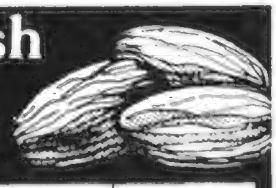

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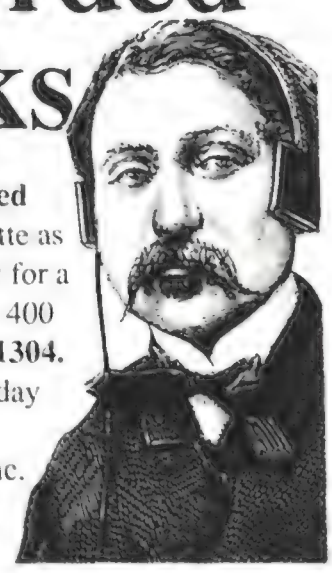

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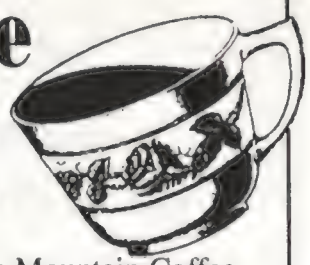

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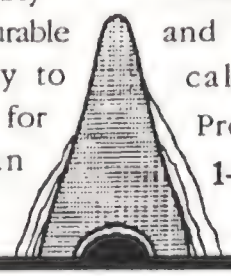

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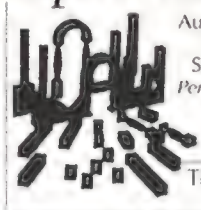

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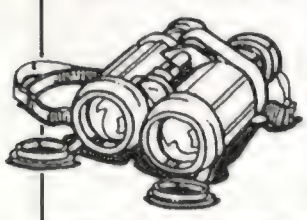

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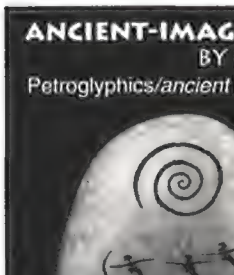

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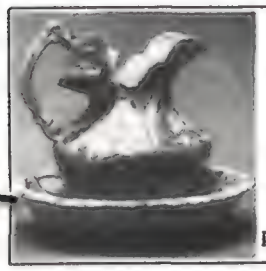

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Book reviews

An Uncertain Grace
Photographs by Sebastião Salgado
Essays by Eduardo Galeano and Fred Ritchin
Aperture, $60/$40 paper

This Brazilian-born photographer has captured arresting images in places no one told him to go, of people rarely granted the camera's attention. Assigning himself to record situations of human extremity—including a mammoth open-pit gold mine in Brazil, and Latin Americans whose lives are barely touched by modernity—Sebastião Salgado produces black-and-white photographic meditations on the beauty and the sorrow of human life.

Among the most startling images are those from Brazil's Serra Pelada gold mine, where in 1986 Salgado found some 50,000 miners hauling sacks of nugget-bearing clay up hand-lashed ladders from a gaping quarry. He portrays the miners' raw vitality—in their mud-slicked backs and sinewy legs—and the volatility of an army of laborers contained by a few carbine-toting policemen. Taking its references from art, religion and popular culture, Salgado's vision blends the obsessive attention to detail of Hieronymus Bosch with the epic scale of Cecil B. DeMille.

An economist before he turned to photography, Salgado believes technology soon will make large-scale manual labor obsolete. This volume serves in part as a progress report on his six-year effort to document this transition around the world. By focusing on industrial, not artisanal, enterprise, Salgado avoids the glamorization of handwork. His subjects, whether a crew of shipbreakers in Bangladesh, hauling scrap with taut

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grace, exhausted sugarcane cutters in Cuba or sweating, dust-coated coal miners in India, barely restrain their simmering energy. These gritty photographs, glowing with chiaroscuro light, evoke a world where inequities cannot extinguish determination or desire.

In photographs of refugees in drought-devastated Ethiopia, Chad, Sudan and Mali, Salgado also displays his intense immersion in a subject. Unlike press crews who snagged images in half-day drop-ins, Salgado spent many weeks in the refugee camps, accompanying the French relief group Médicins sans Frontières (Doctors without Borders) in 1984-85. His photographs convey the trust he won from the drought victims, but he does not presume to put the viewer in their place, only to show the desperation of their circumstances.

The mixture of empathy and detachment in his work reflects something of Salgado's own turbulent experience. Exiled by a dictatorship in his home country some 20 years ago, Salgado began working as an economist for the International Coffee Organization based in London.

In 1973, with no formal training, he took up the camera to document people he encountered during the travels his job required. He soon abandoned economics for photography: an early assignment took him to Africa to record the consequences of a decade of drought. He went on to photograph immigrant workers in Europe and peasants in many parts of South America. In 1979 he joined Magnum Photos, the illustrious international agency. Covering the "first 100 days" of the Reagan Administration in 1981, Salgado took pictures of the attempted assassination of the President that were published worldwide.

Shipbreaker in Bangladesh is among manual laborers documented by Salgado.

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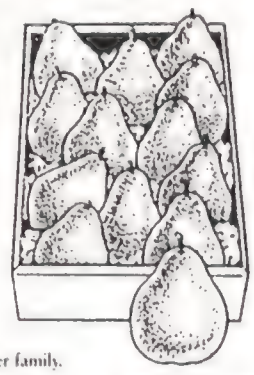

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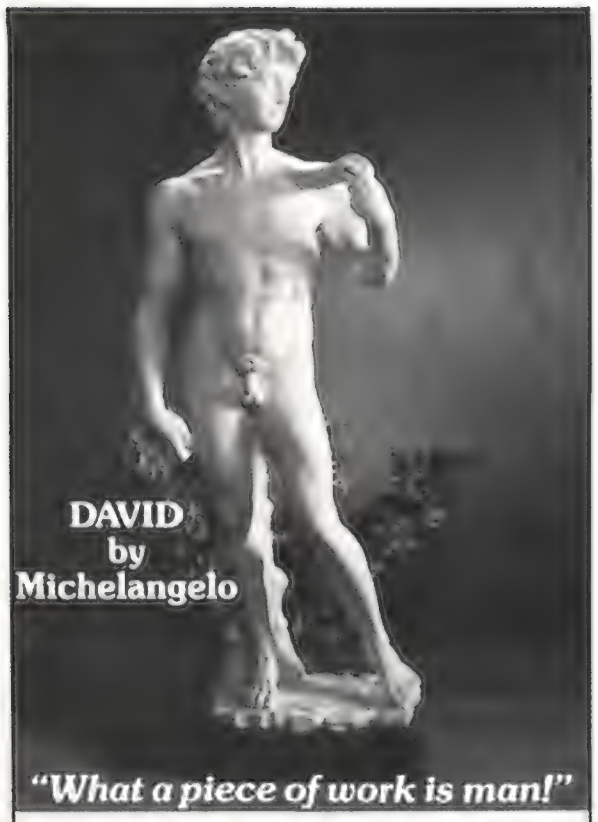

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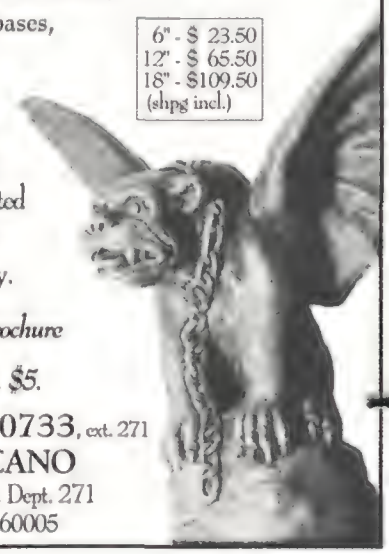

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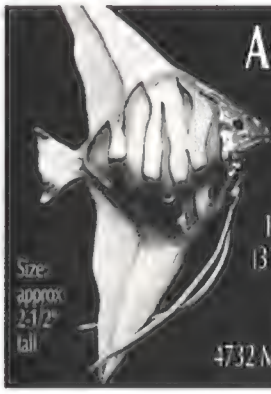

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At heart, more essayist than news photographer, Salgado not only documents material deprivation but gives us insight into the inner lives of his subjects as well. In this he is firmly anchored in Latin American literary and artistic tradition. His portrait of an Ecuadoran mountain couple, cradling a puppy and a newly hatched bird, could be a sort of "Andean Gothic." Such images convey both indignation at poverty and awe at the stolid rootedness of his native continent's peasantry. In the tradition of photography linked to compelling social, moral and political issues—notably that of W. Eugene Smith and Henri Cartier-Bresson—this book is a landmark.
Daniel Cohen is a photojournalist and critic who lives in New Jersey.

The Devil Soldier: The Story of Frederick Townsend Ward, the Most Honored and Controversial American in Chinese History
Caleb Carr
Random House, $25

Spoilt Children of Empire: Westerners in Shanghai and the Chinese Revolution of the 1920s
Nicholas R. Clifford
University Press of
New England, $45/$19.95 paper

Before the Communist revolution of 1949, Chinese peasants made offerings of rice at a certain temple in the suburbs of Shanghai, whose god was said to grant strength and good fortune. There were many such shrines in Old China. But this one was different: the guardian deity was an American—Frederick Townsend Ward, the most remarkable freebooter to strut the stage of 19th-century China.

Ward's implausible life began near the docks of Salem, Massachusetts. He was sent to sea on clippers as a boy. Later, he marched briefly into Mexico with William Walker's "filibustering" army of soldiers of fortune, then worked as a clerk in his father's New York shipping office, and panned for gold in California. Almost 28, in the fall of 1859, he sailed for China. Within two years he had become an imperial mandarin of the fourth rank, and creator of the "Ever Victorious Army," which rolled the armies of the Taiping rebels back from the gates of Shanghai. In September 1862, just two months before his 31st birthday, he was dead.

Ward was a rich blend of opportunism, talent and personal charm. His

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physical courage was legendary. He fought at the head of his troops in an era when soldiers were expected to scale city walls on ladders in the face of enemy fire. He was wounded 15 times in battle, with so little effect that superstitious Chinese credited him with a mystical invulnerability, until he was struck down by a musket ball at the Siege of Tz'u-ch'i.

By the time Ward arrived on the scene in 1860, the Taipings had nearly driven China's weakened Manchu rulers from the entire southern part of the country. The Taipings believed their demented leader was the second son of God, but the movement he led reflected the genuine discontentment of an awakening and cruelly exploited peasantry. When the Taiping armies neared Shanghai, desperate merchants and bureaucrats hired Ward, a military school dropout, to train a Chinese army in the mysterious technology of Western warfare. In *Devil Soldier*, which concentrates on Ward's brief but vivid career in China, Caleb Carr describes the flamboyant adventurer's struggle to convey Western notions of mobility and the use of artillery to soldiers who thought the best way to use guns was to scare their enemies with the loud bang. Astonishingly, Ward's army proved true to its pompous name and swept the Taipings back in almost every battle that it fought.

Carr is at his best tracing the serpentine politics of Ward's patrons, who were as uneasy with a freethinking Yankee in their midst as their spiritual descendants, the Communist apparatchiks, are today with the Western technocrats grudgingly invited to Beijing to help breathe life into the stultified Chinese economy. He is somewhat less successful at penetrating the inner motivations of this man whose "quality of gleaming restlessness" so seduced his contemporaries. Ward, to be sure, presents a difficult challenge for any biographer. Virtually all of his personal papers were lost, destroyed by his sister's executors, and most contemporary official records of his activities were destroyed in the Japanese occupation of Shanghai during World War II. He thus remains an elusive figure, tantalizing and just beyond reach.

Ward's death cut short China's tentative experiment with modernization. His immediate successors were men of narrower vision; his tactics were soon forgotten. A crucial opportunity had been lost.

"More than any other person or organization, Ward and his Ever Victorious Army had pointed the way toward a different kind of China, one in which Manchu chauvinism would have given way to reasoned Chinese acceptance of outside assistance," Carr writes. "That assistance would in turn have allowed the empire to avoid a violent collision with progress and emerge as a twentieth-century power."

Ward may have failed to transform the Chinese imperial army into a modern weapon. But he did save Shanghai, that tumultuous hybrid that had grown up after Britain's defeat of the Celestial Empire in the Opium Wars of the 1840s. Within decades, Shanghai had become Asia's greatest metropolis. As it did so, it grew rich and cruel, simultaneously a byword for corruption and a place of such style and excitement that habitués named it the "Paris of the Orient."

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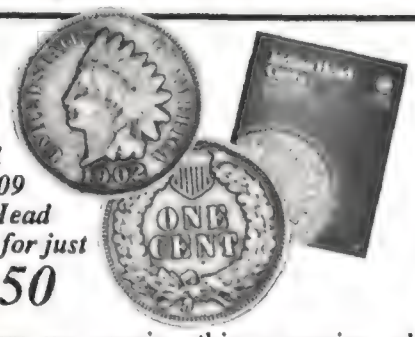

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Frederick Townsend Ward was painted by an unknown Chinese artist in 1862.

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"For all its importance to modern China, Shanghai, with its foreign past, had always been something of an exotic growth on the country's periphery," Nicholas Clifford writes in *Spoilt Chil-*

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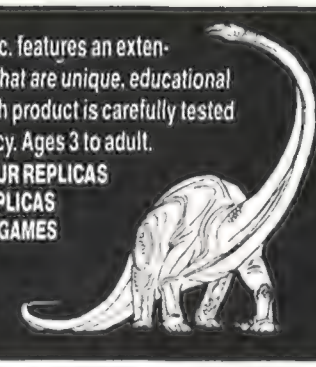

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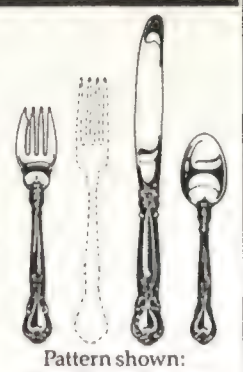

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dren of Empire. "By the 1920s, Chinese were at once captivated by the power and possibilities that modern cities like Shanghai promised and humiliated by the knowledge that the treaty ports owed so much to foreign enterprise."

With critical dispassion, Clifford unravels the intricate, often sleazy story of the self-serving Western taipans, such as the stolid American reactionary Stirling Fessenden, who for many years succeeded in maneuvering their personal power past the shoals of both Chinese nationalism and the diplomatic interests of their home countries. Their ultimate goal was the preservation of a way of life that had all but disappeared in the increasingly democratic West.

Shanghai's foreign residents were governed by their own municipal council. They also employed the protection of their own police and courts, while their firms paid not a cent in taxes to the Chinese government. Servants were cheap and deferential, and the "natives," despite plenty of evidence to the contrary, were assumed to be profoundly grateful for the benefits of Western civilization. Democracy, Clifford tells us, was a "memory of another clime."

Clifford's tale builds majestically toward the crescendo of 1927. A few years earlier, China's fledgling Communist Party had forged an alliance with the Nationalist Party, the Kuomintang (KMT), led by Chiang Kai-shek. Beginning in 1926, KMT troops marched north from Canton in their ultimately successful effort to reunify the country. Although Beijing was the nation's nominal capital, Shanghai was the real prize. Underground Communists surprised Chiang Kai-shek by seizing the city from the warlord Zhang Zongchang, who was said to have had "the physique of an elephant, the brain of a pig, and the temperament of a tiger," and who was universally known as the "Dog Meat General" (a name taken from his favorite gambling game, called "throwing dog meat").

Months later, with the surreptitious assistance of the foreign authorities, a joint force of Nationalists and Shanghai mobsters turned savagely on the Communists, in what proved to be the first battle of the long and bitter Chinese civil war.

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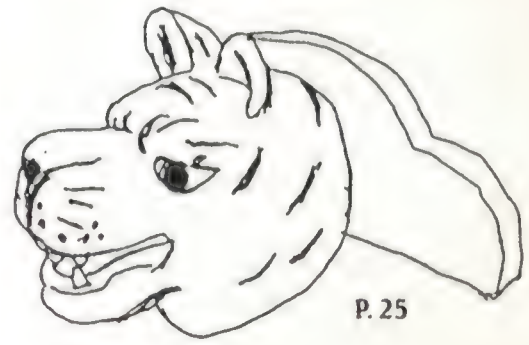

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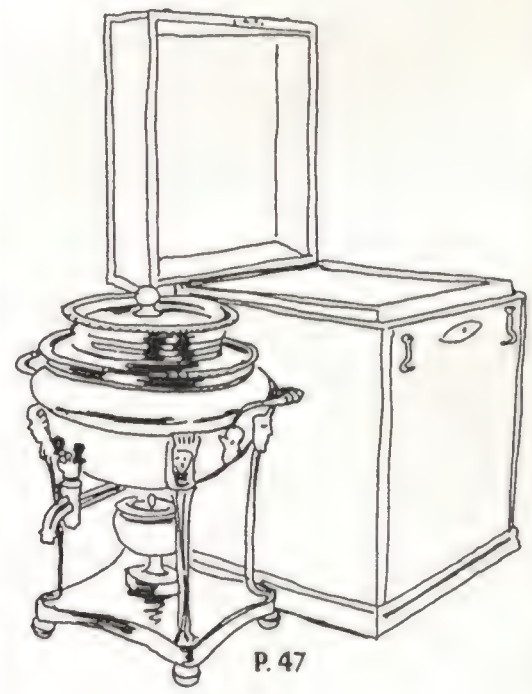

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The end finally came without glory or glamour. After their victory in 1927, the Nationalists methodically chipped away at foreign privileges until they were abruptly made academic by the Japanese occupation. In an effort to strengthen their alliance with Chiang Kai-shek during World War II, the Western powers at last renounced any claim to the extraterritorial rights that had fed both Shanghai's brilliance and its corruption for so long.

The seething Shanghai of the 1920s and '30s may have been an alien, and perhaps unhealthy, growth on the coast of China. Yet, even now, in an age that claims contempt for colonial pretensions, it is difficult not to feel a grudging nostalgia for the extraordinary city that Aldous Huxley once called, "Life itself. Nothing more intensely living can be imagined."
Fergus M. Bordewich wrote *Cathay: A Journey in Search of Old China.*

The Road to Extrema
Bob Reiss
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How Much Is Enough?
Alan Durning
W. W. Norton, $19.95/$8.95 paper

Don't go to extremes. If your mother told you once, she told you a hundred times. But everything about the Amazon is extreme. Jungle so lush as to appear impenetrable; cleared forest, drained of its nutrients and abandoned; diversity unimaginable; extinctions uncounted. A land of opposites where a road to link Brazil to the Pacific and markets in Japan is both the fruit of a "hundred years of dreams" and a "straw sucking up the Amazon."

Bob Reiss wanted to understand what had happened to transform the once admirable goal of developing Brazil's interior into a nightmare of destruction, hoping to find there a universal lesson. "I know every forest is unique," he wrote to scientists and journalists, "but I'm hoping to concentrate on one small area, get to know it, spend months there. I hope what I see will show processes affecting forests around the world. *Is* there a place like that in Brazil, in the Amazon?" Indeed there is.

Amazingly, all of the replies suggested he look at a stretch of highway, BR-364, in the western Amazon, linking the capitals of Rondônia and Acre.

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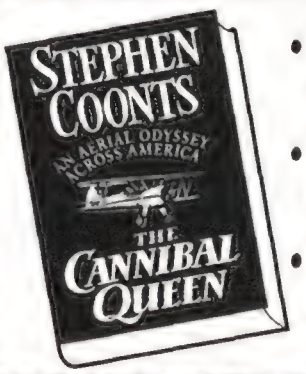

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The Extrema of the book's title, a dusty, depressing little town on the highway, could be a symbol for the conflicting claims that vex the Amazon and, by extension, the rest of the world.

It sits on the border dividing the two states, claimed by both. "I remembered how three weeks before, when I arrived in Brazil, headlines had screamed that Rondônia had sent troops to seize Extrema. . . . A day later the papers had announced Acre was sending troops too. In Brasília, a general named Rubem Bayma Denys assured me there was no danger in traveling to Extrema because federal troops had been dispatched to keep the states from fighting each other. Terrific, I'd figured. *Three* armies."

Reiss studied his Brazilian microcosm, testing the idea that in "medicines, climate, commerce, and finance" what happened in and to the jungle touched people as far away as New York and Beijing. He met scientists like Rosa Lemos, who monitored the effect of dam building on wildlife. He saw Samuel Dam, shortly before it was to go on line; and he saw it months later, a parable of failed hopes—money squandered, the dam incomplete, conservation and tourism plans at a standstill.

In Brazil and in the United States he talked with doctors, cancer patients, refugees, physicists and baseball players, government officials, farmers and gold prospectors. He walked with rubber tappers and dined with ranchers. "I hoped their personal stories would give a reality to what was hidden in statistics."

The most arresting medical story belongs to Darlene Huertas, a 17-year-old New Yorker and victim of Hodgkin's disease. For a while her symptoms—weight loss, sweating, exhaustion—baffled her doctor. But a year later, thanks to his persistence, her courage and a tropical shrub with bell-shaped flowers, Darlene was in remission and had finished high school with a B average.

The drugs used to fight Darlene's Hodgkin's disease, vincristine and vinblastine, came from that decorative little shrub, the rosy periwinkle.

What if the periwinkle hadn't been there when scientists went looking for it in 1949? What if it had been extinct? How many cures, Reiss asks, have we lost as forests and their indigenous peoples—with their knowledge—have vanished? "Each time a shaman dies, it's like a library burning down," he was told.

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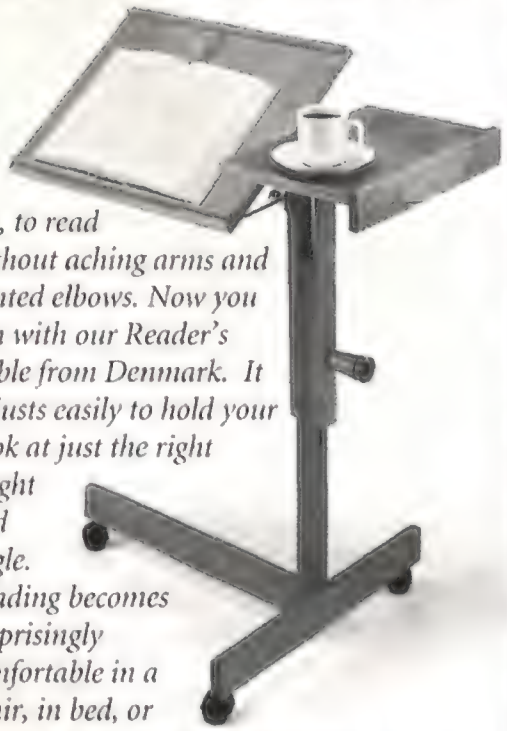

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In *Road to Extrema* Bob Reiss has given us a sober, balanced and absorbing look at what the world stands to gain and to lose in a conflict between those who are rushing to develop and those who want nothing touched. It has a serviceable index but, alas, no maps.

Reiss has drawn some lessons from his travels and the people he met. "To preserve rain forests, we must destroy their illusions: that they are protected by magical distance. That they are unconnected to life thousands of miles away." Like it or not, choices we make, in New York, Paris or Duluth, *will* affect the life of rain forests. The good health or destruction of forests *will* touch us.

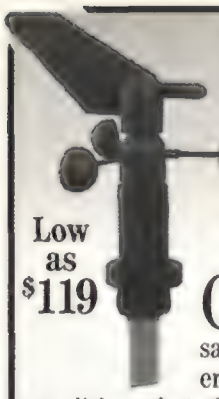
What are we going to do about it? Reiss does have some ideas. Among others, he suggests that "developed countries funding rain forest projects must push for forest zoning and better monitoring of loans." Some countries already have swapped some of their indebtedness for rain forest protection. He would like to see more such swaps arranged. Individuals can shop for "sustainably produced" goods (that is, items that can be harvested or made without destroying irreplaceable resources) and they can support organizations fighting to save the forests. Small things but, as the author points out, "thousands of small acts have helped destroy rain forests, and thousands of small acts can help save them."

Reiss leaves us with an Indian story to ponder. The trees, the story says, hold the sky up. If we cut the trees down, "the sky will fall."

While Reiss focuses primarily on an Amazon microcosm, Alan Durning, in *How Much Is Enough?*, looks at what we humans are doing to Earth as a whole. Are we, he wants to know, prepared to trade the consumer society in for a better model? He sets out to convince us that nothing short of a trade—a culture of permanence in place of the cult of convenience—will keep our planet viable.

The world Durning sees has three broad ecological classes, most easily described by income and lifestyle. The poor, 1.1 billion humans who earn less than $700 a year, live mainly on grains, root crops and legumes. They drink unclean water and live in huts, mostly in Africa, India and South Asia. Their income is 2 percent of the world's total.

The middle-income class, 3.3 billion



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people earning $700 to $7,500 annually per family member, live in modest buildings, mainly in China, Latin America, the Middle East and East Asia. Low-income families in the former Soviet Bloc and in Western industrialized nations also fit in here. These relatively fortunate people have a diet based mainly on grains and water. Their homes probably have electricity for radios and lights, refrigerators and washing machines. They travel by bicycle, bus or train and claim 33 percent of the world's income.

The consumer class—that's us—with 1.1 billion members, has 64 percent of the income, meat, bottled drinks, cars, planes, gadgets and comforts beyond the imagining of our poorest neighbors. All this has not, however, brought contentment. On the contrary, the author says, it has brought us a cycle of consumption, dissatisfaction and more consumption. To the natural realm it has brought disaster.

Durning does not believe that we must continue to buy, consume and expand to prevent economic collapse. He makes a very strong case for a return to a more labor-intensive way of life. He gives examples: repairing and revitalizing (and traveling on) our railroad system could put many people to work and produce far less atmosphere-damaging pollution than airplanes or cars.

He sees more people working fewer hours, more time for family, more time for play or gardening or reading. More time, in fact, for living.

If this sounds Utopian, it isn't necessarily impossible, Durning says. To be sure, it would require a revolution in our way of defining the good life, but the result would be well worth the sacrifice. The alternative, he argues, is to "let our life-style ruin the earth."

Ultimately, "accepting and living by sufficiency rather than excess offers a return to what is, culturally speaking, the human home; to the ancient order of family, community, good work, and good life; to a reverence for skill, creativity, and creation; to a daily cadence slow enough to let us watch the sunset and stroll by the water's edge; to communities worth spending a lifetime in; and to local places pregnant with the memories of generations."

Dee McRae, formerly a SMITHSONIAN Associate Editor, is a freelance writer-editor based in Maryland.

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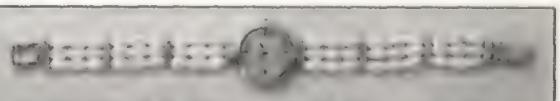

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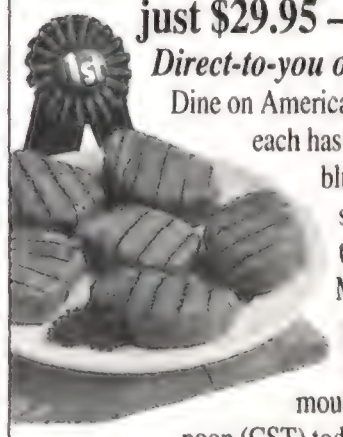

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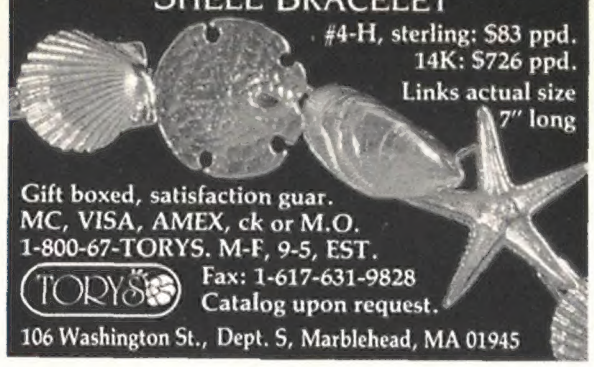

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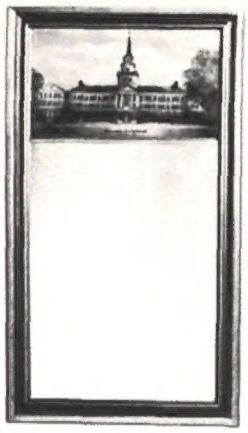

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The big red hen and the Devil's Hoofprints

"Where are we?" I asked my aunt.

"I'm sure we're almost there," she said.

"I know," I said, "but where is that?"

My aunt was driving. I was holding a big red chicken on my lap. We were looking for the Devil's Hoofprints. "The Devil's Hoofprints, Near Bath, North Carolina," was all the booklet had said. "Dirt will not fill these strange depressions, and chickens will not eat out of them."

"We're almost there," my aunt said. She put her arm out the window and waved it around. "I can feel it. Get that chicken feed out of the backseat."

"Junkets," my aunt called these summertime wanderings of ours. Last summer it had been fossil hunting in Virginia. This year we were ferrying our way through North Carolina. My aunt had a taste for the peculiar and the exotic. WORLD'S SMALLEST HORSES! SEE A LIVE PERFORMING BEAR! GHOST OF BLACKBEARD HAUNTS OUTER BANKS! Even if the world's smallest horse turned out to be a medium-sized Shetland pony, and the bear's only trick was to stand upright and make a slow twirl, and the ghost of Blackbeard was nothing but lightning bugs, she was never disappointed. She just banked up more enthusiasm for the next adventure.

My aunt loved ferryboats, and we had spent all of July aimlessly ferrying back and forth across North Carolina's many rivers and inlets. But the problem was that places with names like Sneads Ferry no longer had operating ferries. In those towns, after some searching along the waterfront, I would be sent to ask. I was in the throes of adolescence that summer, suffering from a paralyzing shyness, and my goal in life was to be not noticed. My aunt would park across the street from a knot of rough-looking men lounging outside the feed store, and I would shuffle over to them with my shoulders hunched up to my ears. "Where's the ferry?" I would whisper.

"Ferry?" they would hoot. "FERRY?" They would slap each other and double over laughing. "This here girl's looking for the ferry! Ain't been no ferry here for 50 years, girl," they would say. They would straighten up and look me over. My ears would begin to ring. Then would come the inevitable question. "Where you trying to get to, honey?"

"Well," I would say, gulping, "we're not really trying to get to anywhere. My aunt just wants to ride the ferry."

Big goofy grins would spread over their faces, and I would try to blend in with the air.

"Well she ain't gon' ride no ferry here," one of the men would howl, and I would creep back across the street, to a chorus of snorting and hollering. "She sho ain't gon' ride no ferry here!"

And then my aunt learned about the Devil's Hoofprints. People had been trying to fill the holes since 1813, when they first appeared, but they always came back, six inches deep and the size of dinnerplates. I kept trying to distract her, because I knew that somewhere down the line I was going to have to buy a live chicken from a local farmer.

"Look here," I said, reading from our guidebook, " 'Oldest Episcopal church in North Carolina,' right here in Bath. Why don't you want to go see that church?"

"Chickens will not eat out of those hoofprints," she mused. "Now there's a man with a nice garden. I know he's got some chickens around back." She pulled the car onto the shoulder of the road. "Go ask him."

"Just a plain chicken, please. A live chicken," I mumbled.

The farmer looked at me for a long time. It was just like the men at the feed store. Where you trying to get to, honey? My ears began to ring. But in the end I did get the chicken, a big Rhode Island Red hen with a steely glint in her eye and a surly disposition.

"I'm sure we're almost there," my aunt said, and turned down a little lane into an old pine hammock. Straw was thick on the ground, but after some rooting around we found them. Twelve in all, just as the booklet had said. My aunt sprinkled a handful of chicken feed in each depression, plus one handful on the side.

"That's our control," she said. "We've got to be scientific. Now put that chicken down." I set the old hen on the ground and stepped aside. The hen squatted there for a minute, then she puffed herself up with a little growl, gave us each a beady-eyed glare and stalked off into the woods. Pretty soon she was out of sight. There was a moment of silence. Then my aunt said optimistically, "Well, she didn't eat out of them." After a little fruitless searching in the thickets, we drove off.

That's all I remember from my ferrying summer in North Carolina almost 25 years ago. My aunt died last year, and at her funeral, as the priest droned on about being joined with blessed saints, I said to myself, "I don't know where she's trying to get to, but I'm sure she's almost there." And I hope, someday soon, a little niece will be traveling with her aunt on the back roads of North Carolina, and they'll read in a newsprint booklet somewhere:

"FERAL CHICKENS DISCOVERED IN N.C. No one knows the origin of these mysterious birds, discovered near Bath, North Carolina. Wary and elusive, the giant red chickens have been spotted on moonlit nights . . ."

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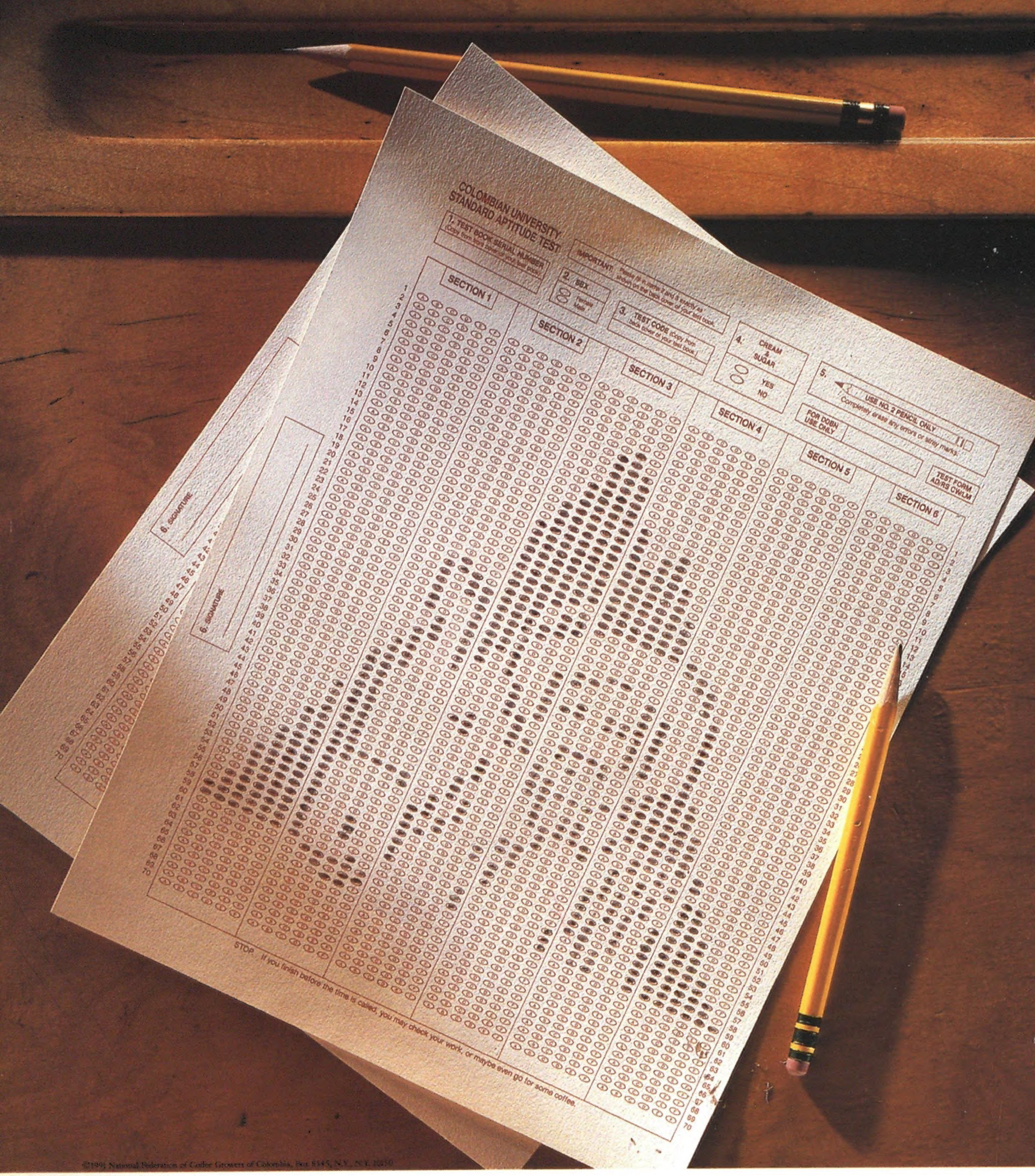
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